



Department of
Design and
Construction

PROJECT ID: LBKA05RUG

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 1 OF 3

LAW

BID BOOKLET

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

Renovation of the Rugby Branch Library Re-Bid

LOCATION:
BOROUGH:
CITY OF NEW YORK

1000 Utica Avenue
Brooklyn 11203

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

Brooklyn Public Library

Locascio Architect



Date: November 23, 2015

16-085

June 20, 2016

CERTIFIED MAIL - RETURN RECEIPT REQUEST

ASHNU INTERNATIONAL, INC
350 BROADWAY - STE. 309
NEW YORK, NY 10013

RE: FMS ID: LBKA05RUG
E-PIN: 85016B0074001
DDC PIN: 8502016LB0002C
RENOVATION OF THE RUGBY BRANCH
LIBRARY RE-BID-BOROUGH OF BROOKLYN
NOTICE OF AWARD

Dear Contractor:

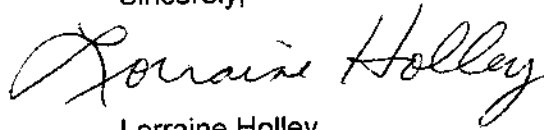
You are hereby awarded the above referenced contract based upon your bid in the amount of \$4,614,115.00 submitted at the bid opening on March 11, 2016. Within ten (10) days of your receipt of this notice of award, you are required to take the actions set forth in Paragraphs (1) through (3) below. For 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,



Lorraine Holley

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

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

PROJECT ID: LBKA05RUG

**Renovation of the Rugby Branch Library Re-Bid
1000 Utica Avenue
Brooklyn 11203**

Name of Bidder: Ashnu International, Inc.

Date of Bid Opening: 03/11/2016

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

Place of Business of Bidder: 58-09, 28 th Avenue, Woodside, N.Y. 11377

Bidder's Telephone Number: 718-267-7590 Bidder's Fax Number: 888-663-4991

Bidder's Email Address: ashnuinternational@gmail.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 New York

Name and Home Address of President: Asha Parikh, 36 Stokes Lane, Colonia, N.J. 07067

Name and Home Address of Secretary: _____

Name and Home Address of Treasurer: _____

BID FORM

PROJECT ID: LBKA05RUG

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
Material Sold and
Delivered

Total Price For
Labor

\$ 1,543,715.00 +

\$ 2,820,000.00

Total Price for Item A= \$ 4,363,715.00

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

\$15,000.00

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

\$235,400.00

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

\$ 4,614,115.00

BBB 3/11/16

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

Bidder: Ashnu International, Inc.

By: *Nayan Parikh*

Nayan Parikh

(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.
I 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 New York ss:

Nyan Parikh being duly sworn says:
I am the V.P. of the above named corporation whose name is subscribed to and which executed
the foregoing bid. I reside at 36 Stokes Lane, Colonia, N.J. 07067
I have knowledge of the several matters therein stated, and they are in all respects true.

Nyan Parikh
(Signature of Corporate Officer who signed the Bid)

Subscribed and sworn to before me this
10th day of March 2016

AB Patel

Notary Public

APURV PATEL
Notary Public, State of New York
No. 01PA5016185
Qualified in Queens County
Commission Expires Sept. 14, 2017

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: Ashnu International, Inc.

Address: 58-09, 28 th Avenue

City: Woodside

State: N.Y.

Zip Code: 11377

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

11-3435601

By: 
Signature:

Title: Vice 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.

Completed Construction Projects

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: ASHNU INTERNATIONAL INC

Name of Project: GUT REHABILITATION OF INTERIOR AND ADDING TWO NEW STORIE

Location of Project: 8 THOMSON STREET, NEW YORK, NY

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

Name: JEFFRY COLE

Title: ARCHITECT Phone Number: 212-375-8551

Brief description of work completed: RENOVATION OF INTERIOR INCLUDING GYPSUM BOARD PARTITION WALL, ACOUSTICAL CEILING, ORNAMENTAL HANDRAILS CASEWORK, RESILIENT FLOOR TILES, VCT TILES

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

Amount of Contract: \$3,000,000.00

Date of Completion: 07/01/2005

Name of Contractor: ASHNU INTERNATIONAL INC

Name of Project: INTERIOR RENOVATION & EXTERIOR RESTORATION OF FIVE STORY BLDG.

Location of Project: 17 BERGEN STREET, BROOKLYN, NY

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

Name: JEFFERY COLE

Title: ARCHITECHT Phone Number: 212-375-8551

Brief description of work completed: FIVE STORY INTERIOR RENOVATION OF APARTMENTS INCLUDING: CARPENTRY, CASEWORK, NEW FLOOR TILES, ROOFING AND EXTERIOR RESTORATION OF BROWNSTONE FACADE, ALSO, UPGRADE THE HVAC, ELECTRICAL & PLUMBING WORK

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

Amount of Contract: \$5,033,193.00

Date of Completion: 02/01/2008

Completed Construction Projects

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: ASHNU INTERNATIONAL INC

Name of Project: PS-99 SCIENCE LAB UPGRADE

Location of Project: 1120 EAST 10TH STREET, BROOKLYN, NY 11230

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

Name: BRUNO GENARI

Title: PROJECT OFFICER Phone Number: 718-752-5741

Brief description of work completed: CONVERSION OF CLASSROOMS INTO SCIENCE LAB INCLUDING: INSTALLATION OF CASE WORK, LAB EQUIPMENT, PLUMBING FIXTURES, ACOUSTICAL CEILING, CLOSED WOOD DOORS, ENTRANCE HOLLOW METAL DOORS

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

Amount of Contract: \$747,000.00

Date of Completion: 12/18/2009

Name of Contractor: ASHNU INTERNATIONAL INC

Name of Project: PS-584 SCIENCE LAB DEMO

Location of Project: 130, ROCHESTER AVENUE, BROOKLYN, NY 11231

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

Name: DULCIA VENTURA

Title: PROJECT OFFICER Phone Number: 718-472-8084

Brief description of work completed: CONVERSION OF FOUR CLASSROOM INTO TWO INTERACTIVE LAB, INCLUDING INSTALLATION OF CASEWORK FOR STUDENTS, LAB EQUIPMENTS, WHITE BOARDS, LCD PROJECTOR, ACOUSTICAL CEILING, GRANITE WORKING COUNTER WITH CERAMIC WALL TILES

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

Amount of Contract: \$767,040.00

Date of Completion: 01/11/2010

Completed Construction Projects

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: ASHNU INTERNATIONAL INC

Name of Project: IS-138 (BROOKLYN) - SUTUDENT TOILET UPGRADE

Location of Project: 4004, 4TH AVENUE, BROOKLYN, NY 11232

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

Name: GLENN MATT

Title: PROJECT OFFICER Phone Number: 718-965-3519

Brief description of work completed: RENOVATION OF TWO BOYS AND GIRLS TOILET ROOM AT TWO FLOORS INCLUDING CERAMIC TILES, TOILET PARTITIONS, PLUMBING FIXTURES IN THIRD AND FOURTH FLOORS

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

Amount of Contract: \$936,000.00

Date of Completion: 12/01/2010

Name of Contractor: ASHNU INTERNATIONAL INC

Name of Project: LINDEN HOUSES (CONTRACT # CM7015064) ROOF TANK REPLACEMENT, SWARMPS, AND LOBBY ENTRANCE UPGRADE

Location of Project: LINDEN HOUSES, 914 VAN SICLEN AVENUE, BROOKLYN, NY 11207

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

Name: SOKOL BEJLERI

Title: SENIOR PROJECT MANAGER Phone Number: 646-763-1758

Brief description of work completed: EXTERIOR MASONRY (SWARMS) - 19 BUILDINGS. LOBBY ENTRANCE REPLACEMENT OF HEAVY DUTY STAINLESS STEEL STOREFRONT SYSTEMS WITH BULLETPROOF GLAZING INSTALLATION OF STAINLESS STEEL DOOR WITH ACCENS CONTROL & ELECTROMAGNETIC LOCK. ROOF TANK - TWO 14,000 GALLON WOODEN WATER TANKS

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

Amount of Contract: \$7,500,000.00

Date of Completion: 06/25/2011

Completed Construction Projects

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: ASHNU INTERNATIONAL INC

Name of Project: CITY HALL PARK

Location of Project: NEW YORK, NY

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

Name: MICHAEL BROTHERS

Title: VICE PRESIDENT

Phone Number: 917-455-8555

Brief description of work completed: STRUCTURAL SHORING, STRUCTURAL CONCRETE, MASONRY, STRUCTURAL REMEDIATION, RENOVATION OF CITY HALL PHASE 2

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

Amount of Contract: \$3,500,000.00

Date of Completion: 11/2012

Name of Contractor: ASHNU INTERNATIONAL INC

Name of Project: PS 154 (BROOKLYN)

Location of Project: 1625 11TH AVENUE, BROOKLYN, NY 11215

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

Name: JEFF SIMMONS

Title: PROJECT OFFICER

Phone Number: 646-208-4944

Brief description of work completed: CONCRETE WORK, EXTERIOR MASONRY, PARAPETS, STRUCTURAL STEEL, ROOFING, DOORS & WINDOWS, FINISHES, FURNISHING

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

Amount of Contract: \$8,333,100.00

Date of Completion: DECEMBER, 2014

Construction Projects in Progress

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: ASHNU INTERNATIONAL INC

Name of Project: PS 69 (BRONX)

Location of Project: 560 THIERLOT AVENUE, BRONX, NY 10473

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

Name: PAUL PAZHAMPILLIL

Title: PROJECT OFFICER Phone Number: 718-752-5754

Brief description of work completed: SITWORK, CONCRETE, EXTERIOR MASONRY, PARAPETS, STRUCTURAL STEEL, WATERPROOFING, FINISHES

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

Amount of Contract: \$6,030,000.00

Date of Completion: JANUARY, 2016

Name of Contractor: ASHNU INTERNATIONAL INC

Name of Project: VN - 87

Location of Project: 1 VERRAZANO BRIDGE PLAZA, STATEN ISLAND, NY

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

Name: PAUL DEPHILLIPS

Title: PROJECT MANAGER Phone Number: 201-655-0226

Brief description of work completed: FOUNDATIONS, UTILITIES, TRENCHES, CONCRETE ENCASED DUCT BANK EXCAVATION, MASONRY, ETC. BUILD NEW 5KV SUB-STATION. PERFORM COMPLETE CIVIL PACKAGE

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

Amount of Contract: \$1,800,000.00

Date of Completion: AUGUST, 2015

Construction Projects in Progress

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: ASHNU INTERNATIONAL INC
Name of Project: S-32769 (Signal System Modernization 71st St & Continental Avenue & Union Turnpike interlocking Queens Line IND)

Location of Project: 71ST STREET AND CONTINENTAL AVENUE, QUEENS, NY

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

Name: JOSEPH PENNA
Title: PROJECT EXECUTIVE Phone Number: 347-865-1423

Brief description of work completed: STRUCTURAL STEEL, CONCRETE, MASONRY AND ARCHITECTURAL FINISHES, TILE PAINT, ETC. CONSTRUCT NEW RELAY ROOMS FOR SIGNAL SYSTEM UPGRADE. COMPLETE CIVIL PACKAGE

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

Amount of Contract: \$8,500,000.00

Date of Completion: APRIL, 2016

Name of Contractor: ASHNU INTERNATIONAL INC

Name of Project: PS 148 (BROOKLYN)

Location of Project: 185 ELLEY STREET, BROOKLYN, NY 11206

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

Name: TEODORA MAURICIO
Title: PROJECT OFFICER Phone Number: 917-418-8940

Brief description of work completed: SITWORK, CONCRETE, EXTERIOR MASONRY, AND PARAPETS, CAST STONE, STRUCTURAL STEEL, THERMAL AND MOISTURE PROTECTION, DOORS AND WINDOWS, FINISHES, SPECIALTIES, PLUMBING & ELECTRICAL

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

Amount of Contract: \$8,504,100.00

Date of Completion: APRIL, 2016

Construction Projects in Progress

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: ASHNU INTERNATIONAL

Name of Project: PRE-K 389 Q (QUEENS)

Location of Project: 96-10 23RD AVENUE, EAST ELMHURST, NY 11369

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

Name: JOE ROMANDETTO
Title: PROJECT OFFICER Phone Number: 718-472-8000, CELL 917-939-0822

Brief description of work completed: SITWORK, CONCRETE, MASONRY, STRUCTURAL STEEL AND METAL FABRICATIONS, CUSTOM CASEWORK, THERMAL AND MOISTURE PROTECTION, DOORS AND WINDOWS, FINISHES, SPECIALTIES, EQUIPMENT, FURNISHING, M. E. P.

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

Amount of Contract: \$7,863,418.00

Date of Completion: JULY, 2015

Name of Contractor: ASHNU INTERNATIONAL INC

Name of Project: PS 315 X (BRONX)

Location of Project: 2865 CLAFLIN AVENUE, BRONX, NY

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

Name: M. SHARIF
Title: PROJECT OFFICER Phone Number: 718-752-5895, CELL 646-879-1762

Brief description of work completed: ASBESTOS ABATMENT, SITWORK, CONCRETE WORK, MASONRY RESTORATION, STRUCTURAL STEEL, AND METAL FABRICATION, ROUGH CARPENTRY, THERMAL AND MOISTURE PROTECTION, DOORS AND WINDOWS, FINISHES, SPECIALTIES, EQUIPMENT, FURNISHING, M. E. P.

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

Amount of Contract: \$14,400,000.00

Date of Completion: APRIL, 2017

BID BREAKDOWN FOR Rugby Branch Library

DWG	SUB DWG	SPEC	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COST OF COS. MATERIALS AND LABOR
			CONTRACT 1 - GENERAL CONSTRUCTION WORK								
		010000	GENERAL REQUIREMENTS								
		010000	SUMMARY								
			Mobilization			LS	80000			70000	1500000
			GENERAL CONDITION			LS	70273			550000	620273
				Subtotal							
		020000	EXISTING CONDITIONS								
		02000	SPECIAL PUBLIC ACCESS FACILITIES								
			Temporary Trailer		1	LS	25000			5000	30000
			Paint Trailer		1	LS	3000			2000	5000
			8" CLF		145	LF	15000			15000	30000
			8" Chainlink Gate (Double)		1	EA	1000			1000	2000
			Trailer Flout		687	SF	7000			6740	13740
			Ramps/Stairs		250	SF	18000			7000	25000
			Temporary Foundation for Trailer		716	SF	7320			7000	14320
			Temporary Closure of Front Facade		989	SF	12000			7780	19780
			Construction Fence		300	LF	10000			20000	30000
				Subtotal							
		02010	SELECTIVE DEMOLITION AND ALTERATION WORK								
			Site Demolition								
			Remove portion of existing slab 7 foundation wall for new storefront foundation work		1	LS	8000			12000	20000
			Foundation work		1	LS	4000			6000	10000
			Remove portion of existing sidewalk slab		2548	SF	7480			18000	25480
			Remove shrubs		11	EA	2500			3000	5500
			Remove salvage & store circular metal bench		1	EA	750			1250	2000
			Remove concrete retaining wall		90	LF	1500			3000	4500
			Remove concrete edging		99	LF	1900			4000	5900
			Remove & salvage fence posts and panels		29	LF	900			2000	2900
			Remove trees, grind stumps, provide compacted fill to grade		11	EA	4000			7000	11000
			grade		1455	SF	4550			10000	14550
			Remove salvages store concrete slabs, tables		10	EA	4000			6000	10000
			Remove & salvage concrete block pavers for re-install including off-site storage		710	SF	4200			10000	14200
			Asphalt paving for temporary trailer		1067	SF	3670			7000	10670
					533	SF	3660			7000	10660

DWG	SUB DWG	SPEC	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COST OF COS. MATERIALS AND LABOR
				Remove & Recycle paving	1486	SF		4860		10000	14860
				Building demolition							
				Remove window security bars & patch	18	EA		600		1000	1600
				Remove windows & frames	18	EA		600		3000	3600
				Remove exterior doors	4	EA		1000		3000	4000
				Remove vestibule doors	2	PR		1000		1000	2000
				Remove interior doors	14	EA		700		700	1400
				Remove Partitions	109	SF		390		700	1090
				Chop/Remove floor slab	359	SF		2180		6000	7180
				Remove planter & foundation	78	LF		950		1000	1950
				Remove roof hatch	1	EA		2000		3000	5000
				Remove column cover panels	616	SF		2000		4160	6160
				Cart plumbing fixtures	1	LS		2000		3000	5000
				Remove kitchenette appliances & patch wall	1	LS		2000		3000	5000
				Remove extg desk	18	LF		800		1000	1800
				Remove sidewalk	2648	SF		10000		15480	25480
				Remove CT floor	420	SF		1200		3000	4200
				Remove wall finishes @ bathrooms	1498	SF		498		1000	1498
				Remove grab bars	3	EA		100		500	600
				Remove toilet partitions	1	EA		100		400	500
				Remove masonry below windows	88	SF		500		1560	2060
				Remove extg roofing system complete	8026	SF		20000		80000	100000
				Remove extg roofing @ canopy	250	SF		2500		10000	12500
				Remove extg coping	110	LF		500		1700	2200
				Remove chimney coping stone	14	SF		700		700	1400
				Remove ACT	6000	SF		5000		15000	20000
				Remove Scaupers	4	EA		2000		2000	4000
				Remove precast window sills	23	LF		1000		1300	2300
				Remove roof deck for steel connection	14	LOC		1600		4000	5600
				Remove masonry wall for new door	1	LOC		1000		1000	2000
				EXTERIOR PAINT REMOVAL							
				Paint removal	89	SF		1000		1000	2000
				Subtotal							
				DUST CONTROL PROCEDURES							
				Dust control procedures	see spec	WKS		2000		3000	5000
				Subtotal							
				SITE PREPARATION							
				Initial protection	1	EA		1500		2500	4000
				Protect driveway	1	EA		1500		2500	4000
				Subtotal							
				EARTHWORK							
				Excavate 4' deep @ removed sidewalk slab	36	CY		16000		20000	36000

DWG	SUB DWG	SPEC	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COST OF COSMATERIALS AND LABOR
				Dispose of excavated material	8	CY	2000	2000		6000	8000
				Backfill w/imported material	28	CY	10000	28000		18000	28000
				Rough grading for new pavement	6219	SF	22190	40000		62190	62190
				Excavation for stools & tables	10	EA	1000	1000		1000	2000
				Fill @ new planter	5	CY	2000	3000		3000	5000
				Subtotal							
		02780		EXTERIOR STONE PAVING							
				Stone slab paving	95	SF	2500	7000		7000	9500
				Reinstall salvaged pavers	710	SF	2100	5000		5000	7100
				Subtotal							
		02831		GATES (Included w/ 022000)							
				Subtotal							
		02900		PLANTS							
				Trees	5	EA	2000	3000		3000	5000
				Shrubs	25	EA	3000	7000		7000	10000
				Ground cover	225	EA	10000	12500		12500	22500
				Reinstall tree grating	7	EA	2000	5000		5000	7000
				Street tree pit w/ granite block border							
				Excavation	10	CY	3000	7000		7000	10000
				Backfill w/ imported	6	CY	3000	3000		3000	6000
				Dispose of Excess material	4	CY	1000	1000		1000	2000
				Granite block border	120	LF	10000	14000		14000	24000
				Subtotal							
		02920		SOIL PREPARATION							
				Temporary street piling to be removed	61	LF	4200	8000		8000	12200
				Subtotal							
		028213		Asbestos Abatement							
				Asbestos Abatement	1	LS	5000	5000		5000	10000
				Subtotal							
		030000		CONCRETE							
				CONCRETE - SITE APPLICATIONS							
				Forming for tables	10	EA	500	500		500	1000
				Concrete cuts	24	LF	1000	1400		1400	2400
				Site retaining wall - curved	18	CY	5000	13000		13000	18000
				Concrete paving	1686	SF	12000	20000		20000	32000
				New sidewalk	2548	SF	10192	15288		15288	25480
				Concrete pads for in grade fixtures	8	EA	6400	9600		9600	16000
				Subtotal							
		03542		CEMENT-BASED SELF-LEVELLING UNDERLAYMENT							
				Self level all floor slabs	118	SF	3800	8000		8000	11600
				Misc. concrete:							
				2" concrete fill w/ WWWF & bonding agent	193	SF	9300	10000		10000	19300
				6" Slab on grade	193	SF	9300	10000		10000	19300

DWG	SUB DWG	SPEC	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COST OF MATERIALS AND LABOR
				Continuous footing @ channel glass storefront	3	CY		1000		2000	3000
				Concrete	127	SF		5700		7000	12700
				Rebars	42	LBS		1200		3000	4200
				Foundation wall @ channel glass storefront							
				Concrete	6	CY		2000		3000	5000
				Forms	381	SF		1810		2000	3810
				Rebars	128	LBS		5800		7000	12800
				Concrete repair @ roof slab	14	LOC		2000		5000	7000
				Replace floor slab @ removed	92	SF		4200		5000	9200
				Structural underpinning @ channel glass facade	61	LF		4200		8000	12200
				Flash patch roof deck - ALLOW 10% of area	803	SF		4030		4000	8030
				Subtotal							
040000				MASONRY							
				UNIT MASONRY							
04200				Type 4 Infill (brick w/ block backup)	21	SF		1100		1000	2100
				Chimney coping stone	15	LF		1000		2000	3000
				Cast window sills	51	LF		4000		6000	10000
				Precast lintel	58	LF		4000		8000	10000
				Remove salvage & reinstall face brick @ window openings	88	SF		4000		8000	12000
				Parapet brick replacement -ALLOW 10% of area	122	SF		10000		14400	24400
				Subtotal							
04510				MASONRY CLEANING							
				Clean brick facade	360	SF		4000		14000	18000
				Subtotal							
04515				MASONRY RESTORATION AND TUCK POINTING							
				Repoint brick facade	90	SF		3000		6000	9000
				Repoint chimney	1	LS		4000		8000	10000
				Repoint brick parapets	1215	SF		10000		14300	24300
				Subtotal							
050000				METALS							
				MISCELLANEOUS METALS							
05500				1/4" Thick alu plate ceiling	117	SF		470		700	1170
				1/4" alu trim @ window heads, jamb & sill	18	SF		800		1000	1800
				1/8" Alu plate kick	114	LF		1000		3000	4000
				1/4" Brushed stainless plate w/letter etching @ book drop	54	EA		600		2000	2600
				Aluminum panel @ wall	6	SF		1000		2000	3000
				Perforated metal screen with text cutouts - ALLOW (main entry sign)	363	SF		3000		6000	9000
				Corrugated metal screen @ HVAC enclosure	664	SF		7000		11000	18000

DWG	SUB DWG	SPEC	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COS/MATERIALS AND LABOR
				Corrugated metal screen @ canopy	350	SF		4000		8000	12000
				Pin Mtd letters on garden wall	21	EA		2000		2200	4200
				Corrugated steel gate @ HVAC enclosure	1	EA		2000		3000	5000
				New Drainage header	64	LF		2400		4000	6400
				Radiator Grills/Covers	249	LF		10000		14900	24800
				HVAC Grille @ wall -ALLOW	15	SF		1000		2000	3000
				8-1/2 Castm aluminu letters attached to vestibule (ROGBY LIBRARY)	1	ea		1000		4000	5000
				Subtotal							
		05600		METAL FRAMING							
				Structural steel support @ new storeroom	498	LBS		4000		6000	10000
				Roof top enclosure structural steel	1717	LBS		7170		10000	17170
				Curved steel backup @ roof top Enclosure	3110	LBS		11100		20000	31100
				Unistrut framing including fittings @ corrugated metal screen @ canopy	500	LF		2000		3000	5000
				Hitit epoxy bolts for unistrut channel @ existing masonry wall	13	EA		3000		10000	13000
				Lintel @ new masonry opening	19	LF		1800		2000	3800
				Subtotal							
		060000		WOOD, PLASTICS AND COMPOSITES							
		06200		CARPENTRY							
				Blocking for new coping	406	LF		2000		2080	4060
				Metal framing plywood/alu panel	55	SF		2000		3500	5500
				Bamboo panel @ book drop closet	427	SF		2000		2270	4270
				WOOD BLOCKING/STAIRS for unistrut framing @ canopy	1	LS		1000		2000	3000
				Lag bolts @ wood blocking for unistrut framing	1	LS		1000		2000	3000
				Closet poles & shelves	4	LF		1000		1000	2000
				Subtotal							
		06400		ARCHITECTURAL WOODWORK							
				Glass backplash over bamboo	180	SF		4000		6000	10000
				Base cabinets w/ counter @ kitchenette	9	LF		4000		5000	9000
				Wall cabinets w/ sliding door @ kitchenette	12	LF		4000		8000	12000
				Workstation counter	19	LF		9000		10000	19000
				Workroom shelving	84	LF		2400		4000	6400
				Cabinets	150	LF		5000		10000	15000
				top	21	SF		2000		4000	6000
				Customer service desk	38	LF		1000		2800	3800
				Subtotal							
		070000		TERMAL AND MOISTURE PROTECTION							
				SHEET MEMBRANE WATERPROOFING							
		07130									

DWG	SUB DWG	Spec	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COST OF MATERIALS AND LABOR
			3-0 x 8-0 Type B (Fixed Transom)		1	EA	600	600		400	1000
			3-0 x 8-0 Type E ALLOW		2	EA	600	600		400	1000
			(2) 2-0 x 8-0 Closet Door		1	PR	600	600		400	1000
			Subtotal								
		08214	DOOR - SPECIAL FABRICATION								
			Children's area door		1	EA	2000	2000		1000	3000
			Work room door		1	EA	1500	1500		1000	2500
			Subtotal								
		08300	ACCESS DOORS								
			Remove & replace floor access hatch		1	EA	2000	2000		1000	3000
			Subtotal								
		08520	ALUMINUM WINDOWS								
			ALUMINUM WINDOWS		296	SF	3000	3000		2000	5000
			Subtotal								
		08700	FINISH HARDWARE								
			Proprietary items:								
			Set 1		3	EA	4000	4000		2000	6000
			Set 2		1	EA	1500	1500		500	2000
			Set 3		8	EA	6000	6000		3000	9000
			Set 4		1	EA	1500	1500		500	2000
			Set 5		2	EA	2000	2000		1000	3000
			Set 6A		1	EA	1000	1000		500	1500
			Set 6B		1	EA	1000	1000		500	1500
			Set 7		1	EA	1000	1000		500	1500
			Set 8		1	EA	1000	1000		500	1500
			Set 9		1	EA	1000	1000		500	1500
			Set 10		1	EA	1000	1000		500	1500
			Subtotal								
		08800	GLASS AND GLAZING								
			Side/ette glazing (Exterior)		71	SF	2000	2000		1000	3000
			Interior SF glazing		202	SF	5000	5000		4000	9000
			Subtotal								
		08840	PLASTIC HONEYCOMB COMPOSITE GLAZING								
			Luminescent Panel - ALLOW		125	SF	7000	7000		5500	12500
			Luminescent Panel @ CUSTOMER Svc de		114	SF	7000	7000		4400	11400
			Subtotal								
		08910	ALUMINUM ASSEMBLIES								
			Vestibule glazing		208	SF	10800	10800		10000	20800
			Glass ceiling @ vestibule		110	SF	5000	5000		8000	11000
			(2) 3-0 x 8-0 Alu/glass doors		2	EA	3000	3000		1000	4000
			3-0 x 9-0 Alu/glass door		1	EA	1500	1500		1000	2500
			3-0 x 8-0 Alu/glass door		1	EA	1500	1500		1000	2500
			Subtotal								
		08955	CHANNEL GLASS FACADE								
			Channel glass		349	SF	6000	6000		4000	10000
			Subtotal								

DWG	SUB DWG	SPEC	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COST OF MATERIALS AND LABOR
		090000	FINISHES								
		09200	LATHING AND PLASTERING								
			Plaster soffit		308	SF		2080		1000	3080
			Plaster finish on existing column		520	SF		1200		4000	5200
		09205	LATHING AND CEMENT PLASTER								
			Subtotal								
		09250	GYPSUM DRYWALL								
			Shade pockets		135	LF		360		1000	1350
			Repair gyp ceilings		1459	SF		459		1000	1459
			Replace 2x2 Act		6000	SF		5000		4000	9000
			Dropped soffit & fascia		629	SF		3290		3000	6290
			Partitions		464	SF		6280		3000	9280
			Type 1 & 1/2 partition - 4" Min Stud, 2 layers		845	SF		10000		6900	16900
			Type 2 partition - 4" Min stud, 1 layer gyp, br		800	SF		6000		3000	9000
			Type 6 furring								
		09310	TILE								
			Tile floor @ elect/storage		130	SF		2000		1000	3000
			Wall Tile		951	SF		10000		5000	15000
			Stone saddle		4	EA		1000		1000	2000
			Stone floor		186	SF		3000		2000	5000
		09660	RESILIENT TILE FLOORING								
			Subtotal								
			Cork rubber tile		6521	SF		7000		12000	19000
			Vinyl base		935	LF		4000		5350	9350
		09685	TILE CARPETING (included w/09310,09660 & 09720)								
			Subtotal								
			Carpet tile A101		637	SF		21850		20000	41850
		09720	DIGITAL PRINT WALL COVERING								
			Digital print wall covering		288	SF		7000		4520	11520
		09900	PAINTING AND FINISHING								
			Subtotal								
			Paint walls		10287	SF		30000		72870	102870
			Paint ceilings		1456	SF		4590		10000	14590
			Paint door frames		13	EA		300		1000	1300
			Scrape & paint extg lintels		58	LF		200		380	580
			Misc Local restoration - Allow		1	LS		2000		1000	3000
		10 0000	SPECIALTIES								
		10350	FLAGPOLE								
			Flagpole		1	EA		2000		3000	5000
		10400	IDENTIFYING DEVICES								
			Subtotal								
			Signage - ALLOW		20	LOC		3000		2000	5000
			1/4" Thick Alu Sign w/Laser cut		1	LS		500		500	1000
			Information - ALLOW								

DWG	SUB DWG	SPEC	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COS: MATERIALS AND LABOR
		10416		TACK BOARDS							
				Fabric tack board	240	SF		500		700	1200
				Tackboard @ vestibule	1	EA		500		800	1300
				LOCKERS							
		10500		Thru wall lock drop	1	EA		3000		2000	5000
				FIRE EXTINGUISHERS AND CABINETS							
		10522		Recessed FEC	5	EA		3000		2000	5000
				Surface And Fec	3	EA		2000		1000	3000
				STORAGE SHELVING							
		10670		Shelving unit @ electrical Rm	1	LS		2000		1000	3000
				TOILET ACCESSORIES							
		10800		Soap dispenser	3	EA		2000		1000	3000
				TP Holder	3	EA		1000		500	1500
				Grab bar	4	EA		1500		500	2000
				Mirror	3	EA		2000		1000	3000
				EQUIPMENT							
		11 0000		APPLIANCES AND EQUIPMENT							
		11450		Refrigerator	1	EA		1000		1000	2000
				Microwave	1	EA		800		400	1200
				Video wall	1	EA		3000		2000	5000
				FURNISHINGS							
		12 0000		CHAIN AND CLUTCH OPERATED WINDOW SHADES							
		12601		Chain & clutch operated window shades	106	LF		2000		1000	3000
				FLOORS MATS AND FRAMES							
		12690		Alu entrance mat	98	SF		500		480	980
				MECHANICAL							
		15 0000		MECHANICAL							
		15010 TO		Proprietary Item (Excluded)							
		15890									
		15910 to									
		15990									
				PLUMBING							
		P15 0000									
		P15062 TO									
		P15410									
				Subtotal				265772		433628	699400

DWG	SUB DWG	SPEC	Item	TYPE	QTY	UNIT	UNIT COST OF MATERIAL	TOTAL COST OF MATERIAL	UNIT COST OF LABOR	TOTAL COST OF LABOR	TOTAL COSTS MATERIALS AND LABOR
		16 0000						49701.34		81091.66	130793
		16010 TO		ELECTRICAL							
		16140									
		16220									
		16442 TO									
		16750 &									
		16751									
		16800									
			Electronic Security System, Security Alarm System, CCTV System, Proprietary Item (Excluded)								
			Subtotal					199647.66		416552.34	616200
			GRAND TOTAL					\$ 1,543,715.00		\$ 2,820,000.00	\$ 4,363,715.00

Tax ID #:

11-3435601

APTE-

PIN#: 85016B0074

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 #	11-3435601	FMS Vendor ID #	VC00149172
Business Name	Ashnu International, Inc.	Contact Person	Nayan Parikh
Address	58-09, 28th Avenue, N.Y. 11377		
Telephone #	718-267-7590	Email	ashnuinternational@gmail.com

Section II: M/WBE Utilization Goal Calculation: Check the applicable box and complete subsection.

PRIME CONTRACTOR ADOPTING AGENCY M/WBE PARTICIPATION GOALS

<input checked="" type="checkbox"/> 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 6)		Calculated M/WBE Participation Amount
	\$4,614,115 ⁴⁰	X	24%	=	\$1,107,387 ⁶⁰ Line 2

PRIME CONTRACTOR OBTAINED PARTIAL WAIVER APPROVAL: ADOPTING MODIFIED M/WBE PARTICIPATION GOALS

<input type="checkbox"/> 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: MWBE Utilization Plan: How Proposer/Bidder Will Fulfill MWBE Participation Goals. Please review the Notice to Prospective Contractors for more information on how to obtain credit for MWBE participation. Check applicable box. The Proposer or Bidder will fulfill the MWBE Participation Goals:

As an MWBE Prime Contractor that will self-perform and/or subcontract to other MWBE 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-MWBE firms will not be credited towards fulfillment of MWBE Participation Goals. Please check all that apply to Prime Contractor:

MBE WBE

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

As a non MWBE Prime Contractor that will enter into subcontracts with MWBE 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 MWBE status? % 30%

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. Electrical work - 474,000⁰⁰
2. HVAC / Mechanical work - 538,000⁰⁰
3. Plumbing work - 100,610⁰⁰
4. Asbestos Abatement - 210,000
5. Flooring - 61,624⁰⁰
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 MWBE 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 MWBE Utilization Plan is true and correct;
 - 3) agree, if awarded this Contract, to comply with the MWBE 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 MWBE 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 MWBE 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 Nayan Parikh
Print Name Nayan Parikh

Date 03/10/2016
Title Vice President

SCHEDULE B – PART III – REQUEST FOR WAIVER OF M/WBE PARTICIPATION REQUIREMENT N/A

Contract Overview

Tax ID # 11-3435601 FMS Vendor ID # _____
 Business Name Ashnu International, Inc.
 Contact Name Nayan Parikh Telephone # 718-267-7590 Email ashnuinternational@gmail.com
 Type of Procurement Competitive Sealed Bids Other Bid/Response Due Date 03/10/2016
 APT E-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 _____

N/A

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: *Nayan Parikh* Date: 03/10/2016
 Print Name: NIYAN PARIKH Title: Vice President

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: _____ %

BIDDER'S IDENTIFICATION OF SUBCONTRACTORS

Project ID: LBKA05RUG

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:

Marsal Plumbing & Heating Inc.

(Print Name)

Agreed amount to be paid Subcontractor: \$ 100,610.00

Description of Plumbing Work:

Common Plumbing work, Hangers, Supports,

Vibration, Controls, Plumbing Insulation, Domestic Water, Sanitary, Storm Drainage, Plumbing Fixtures

2. HVAC CONTRACTOR:

A.M.H. Mechanical

(Print Name)

Agreed amount to be paid Subcontractor: \$538,000.00

Description of HVAC Work:

Mechanical Demo., Basic Mechanical, Hangers, Support, Valves, Piping Expansion, Gauges, Meter, Controllers, Hydronic Piping, Isolation, Insulation, Ductwork, Refrigerent Piping, Misc. Mechanical work

3. ELECTRICAL CONTRACTOR:

Arcadia Electrical Company, Inc.

(Print Name)

Agreed amount to be paid Subcontractor: \$474,000.00

Description of Electrical Work:

Division 16; (Electrical Work)General, Grounding, Bonding, Wire, Cable, Raceways, Devices, Identification, Panelboards, Lighting Fixtures, Security Telecom

BIDDER'S SIGNATURE: The Bidder must sign and complete this form in the spaces provided below:

Mayan Koubelli

(Bidder's Signature)

Ashnu International, Inc.

(Print Name)

58-09 28th Ave Woodside NY 11377

(Address)

Vice President

(Title)

718-267-7590

(Phone #)

888-663-4991

(Fax#)

03/10/2016

(Date)

A. PROJECT REFERENCES- SIMILAR CONTRACTS COMPLETED BY THE BIDDER

List all the contracts substantially completed with 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
PS 154	LUMP SUM	\$8,573,006.00	12/1/2014	NYSICA Jeffery Simmons (646) 208-4944	Neilligan White Architects Bruce Neilligan (212) 675-0500
PS 69	LUMP SUM	\$6,116,594.00	10/15/2015	NYSICA Paul Pazhampilli (917) 416-5536	David Smotrich & Partner LLC James Were (212) 889-4045
Brooklyn Bridge Park	LUMP SUM	\$615,700.00	6/1/2014	Robert Johnson	Easton Architects LLC
100 Gold Street 3rd Floor	Unit Price	2,981,431.00	6/25/2015	DDC	Dewdery Architects (646) 434-4110
100 Gold Street 4rd Floor	Unit Price	\$2,383,309.00	6/23/2014	DDC	Dewdery Architects (646) 434-4110
Rockaway Boardwalk	LUMP SUM	\$5,297,614.71	9/1/2014		Trenton Structural Concrete DDC Agency

Verrazano Bridge	LUMP SUM	\$1,566,771.79	1/29/2016	Mass Electric	
80 Center Street 5th Floor	Unit Price	\$3,223,354.00	10/2/2014	DDC	Dewderry Architects (646) 434-4110

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 Schedule to Complete	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner
PK 560	LUMP SUM	\$6,935,733.00	\$3,312,234.00	\$6,440,157.00	8/9/2016	NYSCA Aniruddh Patel (917) 418-0804	Di Domenico & Partnership Allison Black (212) 337-0400
PK 42	LUMP SUM	\$10,489,929.00	\$4,546,800.00	\$10,202,230.00	12/19/2016	NYSCA Jessie Molina (917) 584-9384	SBLM Architect John Kelly (212) 995-5600
PK 63	LUMP SUM	\$10,873,971.00	3,811,523.00	10,447,551.00	12/5/2016	NYSCA Jessie Molina (917) 584-9384	SBLM Architect John Kelly (212) 995-5600
PK 116	LUMP SUM	\$8,800,000.00	\$2,574,797.91	\$7,974,422.00	5/8/2017	NYSCA William Singh (347) 684-1435	Terrence O'Neal Wendell Green (212) 674-2890 D&B Engineers & Architects
PS 148	LUMP SUM	\$8,802,907.00	\$2,982,971.46	\$2,234,174.00	6/7/2015	NYSCA Teodora Maucido (917) 418-0490	Justin Otto (914) 467-5300
PS 315	LUMP SUM	\$14,400,000.00	\$7,497,000.00	\$10,780,519.00	12/7/2016	NYSCA	Salam & Gancolone (212) 695-1108
Coney Island Hospital	LUMP SUM	\$2,221,698.00	\$2,121,148.00	\$2,121,148.00	7/5/2016	NYCHHC Daniel Collins (718) 616-4127	MJCL PLLC (718) 339-3390

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
<i>None</i>					

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
 Women Owned Business Enterprise
 Disadvantaged Business Enterprise
 Locally Based Business Enterprise
 Emerging Business Enterprise
- 2a. If you are certified as an MBE, WBE, LBE, EBE or DBE, what city/state agency are you certified with? Small Business Service, Port Auth. Are you DBE certified? Yes No
New York State
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
5. Are you a Union contractor? Yes No If yes, please list which local(s) you affiliated with Carpenter, P.C.C., Mason Toulon, Bricklayers, Laborers etc
6. Are you a Veteran owned company? Yes No

PART I: CONTRACTOR/SUBCONTRACTOR INFORMATION

7. 11-3435 601 Employer Identification Number or Federal Tax I.D. ashnuinternational@gmail.com Email Address
8. ASHNU INTERNATIONAL, INC. Company Name
9. 58-09 28TH AVE. WOODSIDE NY, 11377 Company Address and Zip Code
10. Nayan Parikh Chief Operating Officer 718-267-7590 Telephone Number
11. Pareek Shal Designated Equal Opportunity Compliance Officer (If same as Item #10, write "same") 646-296-8088 Telephone Number
12. " Same " Name of Prime Contractor and Contact Person (If same as Item #8, write "same")

13. Number of employees in your company: 80

14. Contract information:

(a) Dept. of Design & Construction (b) \$4,614,115⁰⁰
Contracting Agency (City Agency) Contract Amount

(c) 85016B0074 (d) _____
Procurement Identification Number (PIN) Contract Registration Number (CT#)

(e) 06/30/2016 (f) 12/30/2017
Projected Commencement Date Projected Completion Date

(g) Description and location of proposed contract:

Rugby Branch Library, 1000 Utica Avenue, Brooklyn, N.Y.
Renovation

15. 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 X

If yes, attach a copy of certificate.

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

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.

17. 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 X If yes,

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

18. 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 X

If yes,

(a) Name and address of OFCCP office.

N/A

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

Yes ___ No X

If yes, attach a copy of such certificate.

(c) Were any corrective actions required or agreed to? Yes ___ No X

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

(d) Were any deficiencies found? Yes ___ No X

If yes, attach a copy of such findings.

19. 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 X

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

PART II: DOCUMENTS REQUIRED

N/A

20. 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?

21. 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 ___

N.A.

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

ASHNU INTERNATIONAL OFFICE. 58-09 28th Ave.
WOODSIDE N.Y. 11377

23. 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 ___

N.A.

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

24. 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.

58-09 28th Ave Woodside NY 11377

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

- Minorities and Women
- Individuals with handicaps
- Other. Please specify _____

26. 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.

27. 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 X

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

28. 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 X

If yes, attach a log. See instructions.

29. Are there any jobs for which there are physical qualifications? Yes ___ No X

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

30. 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 X

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

SIGNATURE PAGE

I, (print name of authorized official signing) NAYAN PARIKH 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.

ASHNU INTERNATIONAL, INC.
Contractor's Name

PAPERU SHAN SR PROJECT EXECUTIVE
Name of person who prepared this Employment Report Title

NAYAN PARIKH VICE PRESIDENT
Name of official authorized to sign on behalf of the contractor Title

718-267-7590
Telephone Number

Nayan Parikh 03/23/16
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 23rd day of March 2016
Apurv Patel Nayan Parikh 03/23/2016
Notary Public Authorized Signature Date

APURV PATEL
Notary Public, State of New York
No. 01PA5016185
Qualified in Queens County
Commission Expires Sept. 14, 2017

FORM A. CONTRACT BID INFORMATION: USE OF SUBCONTRACTORS/TRADES

1. Do you plan to subcontract work on this contract? Yes No
2. If yes, complete the chart below.

NOTE: All proposed subcontractors with a subcontract in excess of \$750,000 must complete an Employment Report for review and approval before the contract may be awarded and work commences.

SUBCONTRACTOR'S NAME*	OWNERSHIP (ENTER APPROPRIATE CODE LETTERS BELOW)	WORK TO BE PERFORMED BY SUBCONTRACTOR	TRADE PROJECTED FOR USE BY SUBCONTRACTOR	PROJECTED DOLLAR VALUE OF SUBCONTRACT
UNKNOWN		PLUMBING	PLUMBER	\$ 100,000
UNKNOWN		HVAC	STEAM FITTER	\$ 450,000
UNKNOWN		ELECTRICAL	ELECTRICIAN	\$ 430,000
UNKNOWN		Asbestos Abatement	AcM Handler	\$ 150,000

*If subcontractor is presently unknown, please enter the trade (craft name).

OWNERSHIP CODES

- W: White
- B: Black
- H: Hispanic
- A: Asian
- N: Native American
- F: Female

FORM B: PROJECTED WORKFORCE

TRADE CLASSIFICATION CODES

(J) Journeylevel Workers
 (H) Helper
 (A) Apprentice
 (TRN) Trainee
 (TOT) Total by Column

For each trade to be engaged by your company for this project, enter the projected workforce for Males and Females by trade classification on the charts below.

Trade:

PLUMBING

Union Affiliation, if applicable _____

Total (Col. #1-10):

4

Total Minority, Male & Female
 (Col. #2,3,4,5,7,8,9, & 10):

2

Total Female
 (Col. #6 - 10):

1

	MALES					FEMALES												
	(1)		(2)		(3)	(4)		(5)	(6)		(7)		(8)	(9)	(10)			
	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	Hisp.	Asian	Native Amer.	White Non Hisp.	Black Non Hisp.	Hisp.	Asian	Native Amer.	White Non Hisp.	Black Non Hisp.	Hisp.	Asian	Native Amer.	
J	2		1		1													
H																		
A																		
TRN																		
TOT	2		1		1													

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM B: PROJECTED WORKFORCE

Trade:

Carpenter

Union Affiliation, if applicable

Total (Col. #1-10):

5

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10):

5

Total Female
(Col. #6 - 10):

1

	MALES					FEMALES				
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J	1	1	1	2						
H										
A										
TRN										
TOT	1	1	1	2						

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

TRADE CLASSIFICATION CODES

- (J) Journeylevel Workers
- (H) Helper
- (TOT) Total by Column
- (A) Apprentice
- (TRN) Trainee

For each trade currently engaged by your company for all work performed in New York City, enter the current workforce for Males and Females by trade classification on the charts below.

MALES

FEMALES

Trade: Asbestos Handler

Union Affiliation, if applicable

Total (Col. #1-10):

7

Total Minority, Male & Female (Col. #2,3,4,5,7,8,9, & 10):

5

Total Female (Col. #6 - 10):

1

	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J	2	2	2	1						
H										
A										
TRN										
TOT	2	2	2	1						

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

Trade:

HVAC (Steam Fitter)

Union Affiliation, if applicable

Total (Col. #1-10):

5

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10):

4

Total Female
(Col. #6 - 10):

1

MALES					FEMALES					
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J	1	1	2	1						
H										
A										
TRN										
TOT	1	1	2	1						

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

Trade:

Electrician

Union Affiliation, if applicable

Total (Col. #1-10):

5

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10):

4

Total Female
(Col. #6 - 10):

1

MALES					FEMALES					
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J	1	2	1	1						
H										
A										
TRN										
TOT	1	2	1	1						

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

Trade:

Mason Tonder

Union Affiliation, if applicable

Total (Col. #1-10):

7

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10):

6

Total Female
(Col. #6 - 10):

1

	MALES					FEMALES				
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J	1	1	2	3						
H										
A										
TRN										
TOT	1	1	2	3						

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

Trade:

Meat

Union Affiliation, if applicable

Total (Col. #1-10):

6

Total Minority, Male & Female
(Col. #2, 3, 4, 5, 7, 8, 9, & 10):

5

Total Female
(Col. #6 - 10):

1

	MALES					FEMALES				
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J	1	1	1	3						
H										
A										
TRN										
TOT	1	1	1	3						

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

Trade:

Roofing

Union Affiliation, if applicable

Total (Col. #1-10):

7

Total Minority, Male & Female
(Col. #2, 3, 4, 5, 7, 8, 9, & 10):

6

Total Female
(Col. #6 - 10):

1

	MALES					FEMALES				
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J	1	1	2	3						
H										
A										
TRN										
TOT	1	1	2	3						

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

**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

03/10, 20 16.



SIGNATURE

Nayan Parikh

PRINTED NAME

Vice President

TITLE

Sworn to before me this
10th day of March 20 16.



Notary Public

APURV PATEL
Notary Public, State of New York
No. 01PA5016185
Qualified in Queens County
Commission Expires Sept. 14, 2017

Dated:

BID BOND 1
FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS. That we,
58-09 28th Avenue, Woodside, NY 11377

Ashnu International, Inc.

hereinafter referred to as the "Principal", and General Casualty Company of Wisconsin,
Wall Street Plaza, 88 Pine Street, New York, NY 10005

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 10% of the 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 Renovation of the Rugby Branch
Library Re-Bid, 1000 Utica Avenue, Brooklyn, NY 11203 Project No. LBKA05RUG

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 4th day of March, 2016.

(Seal)

Ashru International, Inc.

(L.S.)

Principal

By: *Nayan Poudel*

(Seal)

General Casualty Company of Wisconsin

Surety

By: *Melissa F. Schmidig*
Melissa F. Schmidig, Attorney-In-Fact

BID BOND 3

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

State of New York County of Queens ss:
On this 10th day of March, 2016, before me personally came
NAYAN PARIKH to me known, who, being by me duly sworn, did depose and say that he
resides at 36 Stokes Lane, Colonia, NJ 07067
that he is the Vice President of Ashnu International Inc
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 AB Patel

AB Patel
Notary Public, State of New York
No. 01PA5016185
Qualified in Queens County
Commission Expires Sept. 14, 2017/17

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


ACKNOWLEDGEMENT OF SURETY

STATE OF: New Jersey

COUNTY OF: Bergen

On this 4th day of March, 2016, before me personally appeared, Melissa F. Schmidig known to be the Attorney-In-Fact of General Casualty Company of Wisconsin, the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.



Notary Public in the State of New Jersey
County of Bergen

DONNA BORNEMANN
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Feb. 22, 2020

CONSENT OF SURETY

A performance bond will be required from the successful contractor on this project, and consequently, all bidders shall submit, with their bid, a consent of surety in substantially the following form:

To: Department of Design and Construction
(Owner)

Re: Ashnu International, Inc.
(Contractor)

Renovation of the Rugby Branch Library Re-Bid, 1000 Utica Avenue, Brooklyn, NY 11203
(Project Description)

Project No. LBKA05RUG

This is to certify that the General Casualty Company of Wisconsin
(Surety Company)

will provide to Department of Design and Construction a performance bond in
(Owner)

the full amount of awarded contract in the event that said contractor is awarded a contract for the above project.

Ashnu International, Inc.

Nayan Poudel
(CONTRACTOR)

General Casualty Company of Wisconsin

Melissa F. Schmidg
(Authorized Agent of Surety Company)

Melissa F. Schmidg, Attorney-In-Fact

Date: March 4, 2016

**CONSENT OF SURETY MUST BE SIGNED BY AN AUTHORIZED AGENT
OR REPRESENTATIVE OF A SURETY COMPANY AND NOT BY THE
INDIVIDUAL OR COMPANY REPRESENTATIVE SUBMITTING THE BID.**

NEW JERSEY SURETY DISCLOSURE STATEMENT AND CERTIFICATION

GENERAL CASUALTY COMPANY OF WISCONSIN, surety on the attached bond, hereby certifies the following:

- (1) The surety meets the applicable capital and surplus requirements of R.S.17:17-6 or R.S.17:17-7 as of the surety's most current annual filing with the New Jersey Department of Insurance.
- (2) The capital and surplus, as determined in accordance with the applicable laws of this State, of the surety participating in the issuance of the attached bond is in the following amount as of the calendar year ended December 31, 2014, which amount has been certified as indicated by the certified public accountant, PriceWaterhouseCoopers LLP, New York, NY:

GENERAL CASUALTY COMPANY OF WISCONSIN

\$309,631,011

- (3) (a) With respect to each surety participating in the issuance of the attached bond that has received from the United States Secretary of the Treasury a certificate of authority pursuant to 31 U.S.C. 9305, the underwriting limitation established therein on July 1, 2014 is as follows:

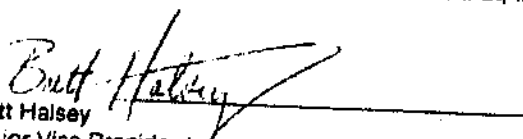
GENERAL CASUALTY COMPANY OF WISCONSIN

\$23,989,000

- (b) With respect to each surety participating in the issuance of the attached bond that has not received such a certificate of authority from the United States Secretary of the Treasury, the underwriting limitation of that surety as established pursuant to R.S.17:18-9 as of December 31, 2014 is as follows: **Not applicable.**
- (4) The amount of the bond to which this statement and certification is attached is \$10% of the amount bid
- (5) If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in items (3)(a) or (3)(b) above, then for each such contract of reinsurance: **Not applicable.**
 - (a) The name and address of each such reinsurer under that contract and the amount of that reinsurer's participation in the contract is as follows: **Not applicable.**
 - (b) Each surety that is party to any such contract of reinsurance certifies that each reinsurer listed under item (5)(a) satisfies the credit for reinsurance requirement established under P.L. 1993, c.243 (C.17:51B-1 et seq.) and any applicable regulations in effect as of the date on which the bond to which this statement and certification is attached shall have been filed with the appropriate public agency.

CERTIFICATE

I, Brett Halsey, as Senior Vice President for GENERAL CASUALTY COMPANY OF WISCONSIN, a corporation admitted in New Jersey, DO HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements are false, this bond is VOIDABLE.


Brett Halsey
Senior Vice President

GENERAL CASUALTY COMPANY OF WISCONSIN
Statement of Admitted Assets, Liabilities and Capital and Surplus
As of December 31, 2014
(In thousands)

	<u>As of</u> <u>Dec 31, 2014</u>
ADMITTED ASSETS	
Cash and invested assets	\$ 441,157
Agents' balances and uncollected premiums, net of commission and balances over 90 days past due	93,482
Reinsurance recoverable on paid losses and loss adjustment expenses	39,441
Net deferred tax asset	23,631
Investment income due and accrued	762
Receivables from parent, subsidiaries and affiliates	61,320
Other assets	78,000
TOTAL ADMITTED ASSETS	<u>\$ 735,783</u>

LIABILITIES AND CAPITAL AND SURPLUS

Liabilities

Reserves for losses and loss adjustment expenses	\$ 243,978
Unearned premiums	94,306
Reinsurance payable on paid loss and loss adjustment expenses	2,094
Ceded reinsurance premiums payable, net of commissions	55,991
Other expenses	949
Commissions payable	18,377
Taxes, licenses and fees	1,504
Remittances and items not allocated	4,399
Provision for reinsurance	1,248
Retroactive reinsurance	(1,037)
Amounts withheld or retained for account of others	3,518
Other liabilities	837
Total Liabilities	<u>\$ 428,161</u>

Capital and Surplus

Common stock	\$ 4,000
Gross paid in and contributed surplus	277,978
Special surplus funds	1,037
Unassigned funds (deficit)	46,519
Treasury stock, at cost	(19,802)
Total capital and surplus	<u>\$ 308,632</u>
Total liabilities and capital and surplus	<u>\$ 735,793</u>

I, Brett Halsey, Senior Vice President of General Casualty Company of Wisconsin hereby certify that the above is an accurate representation of the financial statement of General Casualty Company of Wisconsin dated December 31, 2014, as filed with the various State Insurance Departments and is a true and correct statement of the condition of General Casualty Company of Wisconsin as of that date.

GENERAL CASUALTY COMPANY OF WISCONSIN

By: Brett Halsey
Brett Halsey, Senior Vice President

Subscribed and sworn to me this 31st day of March, 2015.

SIMA S. PATEL
NOTARY PUBLIC, STATE OF NEW YORK
QUALIFIED IN ALBANY COUNTY

By: Sima S. Patel
Sima S. Patel, Notary Public

NO. 01PA6169503
COMMISSION EXPIRES JAN. 18 2015

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE BLUE BORDER

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS, that General Casualty Company of Wisconsin (the "Company"), a corporation duly organized and existing under the laws of the State of Wisconsin, having its principal office at 88 Pine Street, New York, NY 10005, has made, constituted and appointed, and does by these presents make, constitute and appoint Donna J. Bornemann, Paul Matrale, James V. Gardella, Melissa F. Schmidig, and Charles J. Cavadini of Professional Insurance Associates, Inc. of Carlstadt, NJ its true and lawful Attorney-in-Fact, to sign its name as surety only as delineated below and to execute, seal, acknowledge and deliver any and all bonds and undertakings, with the exception of financial guaranty insurance, to the same extent as if such bonds had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office in their own proper persons.

This Power of Attorney shall be construed and enforced in accordance with, and governed by, the laws of the State of New York, without giving effect to the principles of conflict of laws. This Power of Attorney is granted pursuant to the following resolutions, which were duly and validly adopted at a meeting of the Board of Directors of the Company with effect from June 30, 2014:

RESOLVED, that the Chief Executive Officer, any President, any Executive Vice President, any Senior Vice President, any Vice President, the Corporate Secretary or any Assistant Corporate Secretary is authorized to appoint one or more Attorneys-in-Fact and agents to execute on behalf of the Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; to prescribe their respective duties and the respective limits of their authority; and to revoke any such appointment at any time;

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking will be valid and binding upon the Company when (a) signed by any of the aforesaid authorized officers; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and agents pursuant to the power prescribed in his/her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and

FURTHER RESOLVED, that the signature of any authorized officer and the seal of the Company may be drawn on or affixed by facsimile or electronically transmitted by email to any power of attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship obligation of the Company, and such signature and seal when so used shall have the same force and effect as though manually affixed. The Company may continue to use for the purposes herein stated the facsimile or electronically reproduced signature of any person or persons who shall have been such officer or officers of the Company, notwithstanding the fact that they may have ceased to be such at the time when such instruments shall be issued.

IN WITNESS WHEREOF, the Company has caused these presents to be signed and attested by its appropriate officers and its corporate seal hereunto affixed this December 22, 2015.

Attest:

GENERAL CASUALTY COMPANY OF WISCONSIN

(Seal)

By:

Brett Halsey
Brett Halsey
Senior Vice President

By:

Matt
Matt Curran
Senior Vice President

STATE OF NEW YORK)
)SS.:
COUNTY OF NEW YORK)

On this December 22, 2015, before me personally appeared Brett Halsey and Matt Curran, both to me known to be Senior Vice Presidents of General Casualty Company of Wisconsin, and that each, as such, being authorized to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporation by each as a duly authorized officer.

CAROL ROSENSTEEL

NOTARY PUBLIC-STATE OF NEW YORK
No. 01RO6238531
Qualified in New York County
My Commission Expires April 18, 2019

By:

Carol Rosensteel
Carol Rosensteel, Notary Public

CERTIFICATE

I, Jose Ramon Gonzalez, Jr., the undersigned, Corporate Secretary of General Casualty Company of Wisconsin do hereby certify that the foregoing is a true, correct and complete copy of the original Power of Attorney; that said Power of Attorney has not been revoked or rescinded and that the authority of the Attorney-in-Fact set forth herein, who executed the bond or undertaking to which this Power of Attorney is attached, is in full force and effect as of this date.

Given under my hand and seal of the Company, this 4th day of March 2016.

(Seal)

By:

J. R. Gonzalez

Jose Ramon Gonzalez, Jr., Corporate Secretary

CERTIFICATE OF SOLVENCY UNDER SECTION 1111 OF THE NEW YORK INSURANCE LAW

STATE OF NEW YORK
DEPARTMENT OF FINANCIAL SERVICES

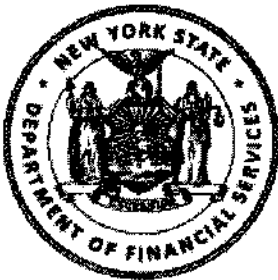
It is hereby certified that

General Casualty Company of Wisconsin

Of Sun Prairie, Wisconsin

a corporation organized under the laws of the State of Wisconsin and duly authorized to transact the business of insurance in this State, is qualified to become surety or guarantor on all bonds, undertakings, recognizances, guaranties and other obligations required or permitted by law; and that the said corporation is possessed of a capital and surplus including gross paid-in and contributed surplus and unassigned funds (surplus) aggregating the sum of \$309,631,011 (Capital \$4,000,000) as is shown by its sworn financial statement for the year ending December 31, 2014 on file in this Department, prior to audit.

The said corporation cannot lawfully expose itself to loss on any one risk or hazard to an amount exceeding 10% of its surplus to policyholders, unless it shall be protected in excess of that amount in the manner provided in Section 4118 of the Insurance Law of this State.



In Witness Whereof, I have

unto set my hand and affixed

official seal of this Department
in the City of Albany, this 2nd
day of April 2015.

Benjamin M. Lawsky
Superintendent of Insurance

By

A handwritten signature in cursive script that reads "Jacqueline Catalfamo".

Jacqueline Catalfamo
Special Deputy Superintendent

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

March 2, 2016

ADDENDUM No. # 1

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

LBKA05RUG

Renovation of the Rugby Branch Library Re-Bid

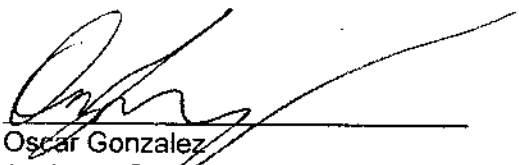
This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

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

1. **Bidders Questions and Responses to Questions:**
See Attachment A.
2. **Revisions to the Bid Booklet:**
See Attachment B.


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) 391-3170, (718) 391-1016, or by fax at (718) 391-2615.



Oscar Gonzalez
Assistant Commissioner
Libraries/Pass-Throughs and Grants

Ashno International, Inc.
Name of Bidder

By: 

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

March 4, 2016

ADDENDUM No. # 2

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

LBKA05RUG

Renovation of the Rugby Branch Library Re-Bid

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 March 8, 2016, at 2:00 pm is rescheduled to March 11, at 2:00 pm.**
Contract #1 – General Construction Work
2. **Bidders Questions and Responses to Questions:**
See Attachment A.
3. **Revisions to the Specifications:**
See Attachment B.
4. **Revisions to the Drawings:**
See Attachment C.

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) 391-3170, (718) 391-1016, or by fax at (718) 391-2615.



Oscar Gonzalez
Assistant Commissioner
Libraries/Pass-Throughs and Grants

Ashnu International Inc
Name of Bidder

By: Nayan Poudel

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

March 8, 2016

ADDENDUM No. # 3

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

LBKA05RUG

Renovation of the Rugby Branch Library Re-Bid


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. **Bidders Questions and Responses to Questions:**
See Attachment A.
2. **Revisions to the Bid Booklet:**
See Attachment B.

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) 391-3170, (718) 391-1016, or by fax at (718) 391-2615.



Oscar Gonzalez
Assistant Commissioner
Libraries/Pass-Throughs and Grants

Ashin International Inc.
Name of Bidder

By: Nayan Kumbhakar

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.

**BID BOOKLET
PART A**

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PROJECT ID: LBKA05RUG

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

BID BOOKLET

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

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)
- Schedule B: M/WBE 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)
- Any Addenda issued prior to the receipt of bids

**FAILURE TO SUBMIT THE EIGHT 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 the bidder has any questions or requires additional information, please contact the Department of Design and Construction by phone (718-391-2601) or by fax (718-391-2615).
 - (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.

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: Fluid Applied Membrane Roofing System
Specification Section: 07500
Drawings: A-104, A-105, A-204
Manufacturer: Kemper System America's Kemperol 2K-PUR Component A
Allowance Amount: Not to Exceed \$ 85,670

2. Proprietary Item: Finish Hardware
Specification Section: 08700
Manufacturer: Best Stanley Security Solutions
9K Series Heavy duty cylindrical locks and levers
Mortise Locksets 40 H Series
Allowance Amount: Not to Exceed \$ 32,000

3. Proprietary Item: HVAC Instrumentation and Controls
 Specification Section: 15900
 Manufacturer: HVAC BMS Honeywell System
 Facility Management and Control System (FMCS) shall be based on the
 Honeywell WEBs System incorporating the Niagara Framework.
 Allowance Amount: Not to Exceed \$ 18,200
4. Proprietary Item: Fire Alarm
 Specification Section: 16220
 Manufacturer: Fire Alarm System- Edward's System Technology
 Safeway Fire Protection Monitoring
 Alarm Panels - Edwards (MIR2) EST2
 Remote Annunciator - Edwards - RLCD-R
 Allowance Amount: Not to Exceed \$ 19,842
5. Proprietary Item: Electronic Security System- Card Access System
 Specification Section: 16800
 Manufacturer: LIF Security (Continental)
 Allowance Amount: Not to Exceed \$ 1,475
6. Proprietary Item: Electronic Security System- Security Alarm System
 Specification Section: 16800
 Manufacturer: LIF Security (NAPCO)
 Allowance Amount: Not to Exceed \$ 9,827
7. Proprietary Item: Electronic Security System - CCTV System
 Specification Section: 16800
 Manufacturer: CCTV System - Panasonic
Network CCTV Requirements
 (Pelco DS PEL-DSSRV2040US)
 (PEL-ENC5516US)
 (ENC5400-4PORT)
 (Pelco Cameras FD2DWV106)
 (Pelco Ceiling Mount PEL-FDFK)
 (Altronix R2416300UL)
 APC SUA 1500RM2U
 (DWR-24-26)
 Middle Atlantic (PFD-24)
 Middle Atlantic (MDA-PD915R)
 (Manufacturer Samsung or Equal)
 (Samsung or equal)
 (Peerless or Equal)
 (Windy City Plenum)
 Belden 6300UE-877
 Uninterrupted Power Supply

24 Space Double Swing Wall Rack 26" Deep
Solid Front Rack Door
Rail Type 12 Position Power Distribution 20 Amp
19" LCD Monitor (Black)
32" LCD Monitor w/NTSC input
Adapter plate for 32" monitor

Allowance Amount:

Not to Exceed \$ 18,000

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SPECIAL EXPERIENCE REQUIREMENTS

Special Experience Requirements apply as indicated below.

Bidder:	General Construction	<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	NO
Specific Areas of Work:	General Construction	<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	NO
Manufacturers:	General Construction	<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	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 16800 : Electronic Security System

- (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.

- (F) **EXPERIENCE REQUIREMENTS FOR MANUFACTURER(S)**: The special experience requirements set forth below apply to the manufacturer that will supply or fabricate specific material or equipment. Compliance with such experience requirements will be evaluated after an award of contract. Within two (2) weeks of award, the contractor will be required to submit the qualifications of the proposed manufacturer(s). Once approved, no substitution will be permitted, unless the qualifications of the proposed replacement have been approved in writing in advance by the City.

- (1) Special experience requirements apply to the manufacturer(s) of material and/or equipment specified in the section(s) set forth below.

General Construction

- Section 16800 : Electronic Security System

- (2) Special experience requirements applicable to the manufacturer(s) of specified material or equipment are summarized below. Such experience requirements are set forth in full in the Addendum to the General Conditions.

- The manufacturer providing the material or equipment specified in this section must, for the past five (5) years, have been regularly engaged in the manufacture of material or equipment similar in type to that required for this Project. Such similar material or equipment provided by the manufacturer must have been in satisfactory service for not less than five (5) years.

Qualification Form

Project ID: LBKA05RUG

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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MWBE 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) days from the date of mailing or upon delivery, if delivered.

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.

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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 non-responsive.

(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 multi-year 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 zhangji@ddc.nyc.gov or via facsimile at (718) 391-1886. 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.

Tax ID #: _____

APT E-
PIN#: 85016B0074

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 # 85016B0074 FMS Project ID#: LBKA05RUG
 Project Title/Agency Renovation of the Rugby Branch Library
 PIN # 8502016LB0002C
 Bid/Proposal
 Response Date: Tuesday, March 08, 2016
 Contracting Agency Department of Design and Construction
 Agency Address 30-30 Thomson Avenue City Long Island City State NY Zip Code 11101
 Contact Person Norma Negron Title MWBE Liaison & Compliance Analyst
 Telephone # (718) 391-1502 Email negronn@ddc.nyc.gov

Project Description (attach additional pages if necessary)

This Project consists of replacement of all windows, street front façade renovation, replacement of interior finishes and plumbing fixtures, electrical/data and fire alarm work, targeted interior and exterior light fixture replacement/additions, replacement of rooftop/mechanical room HVAC equipment and new shelving/furnishing.

M/WBE Participation Goals for Services

Enter the percentage amount for each group or for an unspecified goal. Please note that there are no goals for Asian Americans in Professional Services

Prime Contract Industry: Construction

Group	Percentage
<u>Unspecified *</u>	<u>24 %</u>
or	
<u>Black American</u>	<u>Unspecified %</u>
<u>Hispanic American</u>	<u>Unspecified %</u>
<u>Asian American</u>	<u>Unspecified %</u>
<u>Women</u>	<u>Unspecified %</u>
Total Participation Goals	24 %

Line 1

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

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Tax ID #: _____

APT E-

PIN#: 85016B0074

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

<input type="checkbox"/> 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 6)		Calculated M/WBE Participation Amount
	\$	X	=	\$	Line 2

PRIME CONTRACTOR OBTAINED PARTIAL WAIVER APPROVAL: ADOPTING MODIFIED M/WBE PARTICIPATION GOALS

<input type="checkbox"/> 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 _____
Print Name _____

Date _____
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 Competitive Sealed Bids Other Bid/Response Due Date _____
 APT E-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.

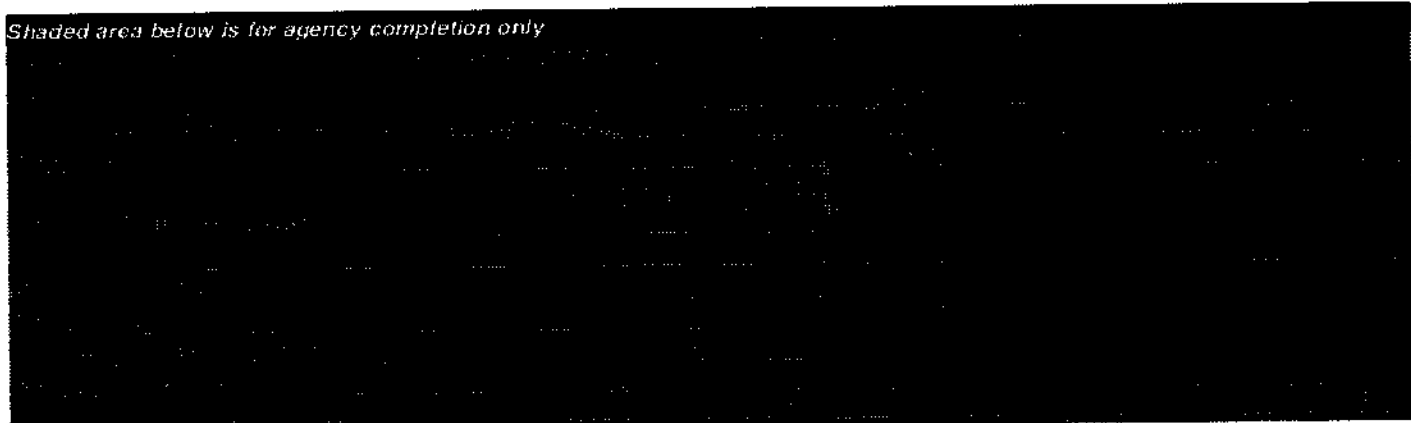
Signature: _____

Date: _____

Print Name: _____

Title: _____

Shaded area below is for agency completion only



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

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

PROJECT ID: LBKA05RUG

**Renovation of the Rugby Branch Library Re-Bid
1000 Utica Avenue
Brooklyn 11203**

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:

10. **M/WBE UTILIZATION PLAN:** By signing its bid, 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.

BID FORM

PROJECT ID: LBKA05RUG

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
Material Sold and
Delivered

Total Price For
Labor

\$ _____ + \$ _____ 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) **\$235,400.00**
- 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

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

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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. I 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 completed 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.

All listed subcontractors must be used to perform the work identified on this form for the amount listed. The listed subcontractors are not alternatives to each other. The list of subcontractors is to be submitted in a separate sealed envelope by completing the form 'Bidders Identification of Subcontractors' for 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 complete this form using its own name.

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 Schedule B (Subcontractor Utilization Plan), the bid will be non-responsive unless the bidder requests and obtains a Waiver of Target Subcontracting Percentage (Schedule B, Part III) in advance of bid submission. Failure to submit the completed 'BIDDERS IDENTIFICATION OF SUBCONTRACTORS' form that includes the names of subcontractors and the agreed upon amounts to be paid to such subcontractors will render the bid non-responsive.

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: LBKA05RUG

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.

<p>1. PLUMBING CONTRACTOR:</p> <p>_____</p> <p>(Print Name)</p> <p>Agreed amont to be paid Subcontractor: \$ _____</p>	<p>Description of Plumbing Work:</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>2. HVAC CONTRACTOR:</p> <p>_____</p> <p>(Print Name)</p> <p>Agreed amont to be paid Subcontractor: \$ _____</p>	<p>Description of HVAC Work:</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>3. ELECTRICAL CONTRACTOR:</p> <p>_____</p> <p>(Print Name)</p> <p>Agreed amont to be paid Subcontractor: \$ _____</p>	<p>Description of Electrical Work:</p> <p>_____</p> <p>_____</p> <p>_____</p>

BIDDER'S SIGNATURE: The Bidder must sign and complete this form in the spaces provided below:

(Bidder's Signature) (Print Name)

(Address)

(Title) (Phone #) (Fax#) (Date)

**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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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Utica Avenue, Brooklyn NY 11203
Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
CONTRACT 1 - GENERAL CONSTRUCTION WORK								
GENERAL REQUIREMENTS								
010000	SUMMARY							
	Mobilization		LS					
	Subtotal							
EXISTING CONDITIONS								
SPECIAL PUBLIC ACCESS FACILITIES								
020000	Temporary Trailer		MO					
	Paint Trailer		LS					
	8' CLF		LF					
	8'H Chainlink Gate (Double)		EA					
	Trailer Fitout		SF					
	Ramps/Stairs		SF					
	Temporary Foundation for Trailer		LF					
	Temporary Closure of Front Façade		SF					
	Construction Fence		LF					
	Subtotal							
SELECTIVE DEMOLITION AND ALTERATION WORK								
02010	Site Demolition							
	Remove Portion Of Existing Slab & Foundation Wall For New Storefront Foundation Work		SF					
	Remove Portion Of Existing Sidewalk Slab		EA					
	Remove Shrubs		EA					
	Remove, Salvage & Store Circular Metal Bench		LF					
	Remove Concrete Retaining Wall		LF					
	Remove Concrete Edging		LF					

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

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Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Remove & Salvage Fence Posts and Panels		LF					
	Remove Trees, Grind Stumps, Provide Compacted fill to Grade		EA					
	Remove Soil in Raised Planting Area to Grade		SF					
	Remove Salvage Store Concrete Stools, Tables		EA					
	Remove & Salvage Concrete Block Pavers for Reinstall Including Offsite Storage		SF					
	Asphalt Paving for Temporary Trailer		SF					
	Remove & Recycle Paving		SF					
	Building Demolition							
	Remove Window Security Bars & Patch		EA					
	Remove Windows & Frames		EA					
	Remove Exterior Doors		EA					
	Remove Vestibule Doors		PR					
	Remove Interior Doors		EA					
	Remove Partitions		EA					
	Chop/Remove Floor Slab		SF					
	Remove Planter & Foundation		SF					
	Remove Roof Hatch		LF					
	Remove Column Cover Panels		EA					
	Cart Plumbing Fixtures		SF					
	Remove Kitchenette Appliances & Patch Wall		EA					
	Remove Extg Desk		LS					
	Remove Sidewalk		LF					
	Remove CT Floor		SF					
	Remove Wall Finishes @ Bathrooms		SF					
	Remove Grab Bars		SF					
	Remove Toilet Partitions		EA					
	Remove Masonry Below Windows		EA					
	Remove Extg Roofing System Complete		SF					
	Remove Extg Roofing @ Canopy		SF					

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

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Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Remove Extg Coping		LF					
	Remove Chimney Coping Stone		LF					
	Remove ACT		SF					
	Remove Scuppers		EA					
	Remove Precast Window Sills		LF					
	Remove Roof Deck for Steel Connection		LOC					
	Remove Masonry Wall for New Door		LOC					
	Subtotal							
02085	EXTERIOR PAINT REMOVAL Paint Removal		SF					
	Subtotal							
02090	DUST CONTROL PROCEDURES Dust Control Procedures		WKS					
	Subtotal							
02100	SITE PREPARATION Inlet Protection Protect Drywell		EA EA					
	Subtotal							
02300	EARTHWORK Excavate 4' Deep @ removed Sidewalk Slab Dispose Of Excavated Material Backfill W/ Imported Material Rough Grading for New Pavement Excavation for Stools & Tables Fill @ New Planter		CY CY CY SF EA CY					
	Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
02780	EXTERIOR STONE PAVING							
	Stone Slab Paving		SF					
	Reinstall Salvaged Pavers		SF					
	Subtotal							
02831	CHAIN LINK FENCES AND GATES (Included w/ 02000)							
02900	PLANTS							
	Trees		EA					
	Shrubs		EA					
	Ground Cover		EA					
	Reinstall Tree Grating		EA					
02920	Street Tree Pit w/ Granite Block Border							
	Excavation		CY					
	Backfill w/ Imported		CY					
	Dispose of Excess Material		CY					
	Granite Block Border		LF					
	Subtotal							
02820	SOIL PREPARATION							
	Temporary Sheet Piling to Be Removed		LF					
	Subtotal							
028213	Asbestos Abatement							
	Asbestos Abatement		LS					
	Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid

Location: 1000 Ulica Avenue, Brooklyn NY 11203

Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
03 0000	CONCRETE							
03301	CONCRETE - SITE APPLICATIONS							
	Footings for Tables		EA					
	Concrete Curbs		LF					
	Concrete Pads		SF					
	Site Retaining Wall - Curved		CY					
	Concrete Paving		SF					
	New Sidewalk		SF					
	Concrete Pads for In Grade Lt Fixtures		EA					
	Subtotal							
03542	CEMENT-BASED SELF-LEVELING UNDERLAYMENT							
	Self Level All Floor Slabs		SF					
	Misc. Concrete:							
	2" concrete Fill W WWF & Bonding Agent		SF					
	6" Slab On Grade		SF					
	Continuous Footing @ Channel Glass Storefront							
	- Concrete		CY					
	- Forms		SF					
	- Rebar		LBS					
	Foundation Wall @ Channel Glass Storefront							
	- Concrete		CY					
	- Forms		SF					
	- Rebar		LBS					
	Concrete Repair @ Roof Slab		LOC					
	Replace Floor Slab @ Removed		SF					
	Structural Underpinning @ Channel Glass Façade		LF					
	Flash Patch Roof Deck - ALLOW 10% of Area		SF					
	Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
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Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
<u>04.0000</u>	MASONRY							
04200	UNIT MASONRY							
	Type 4 Infill (Brick w/ Block backup)		SF					
	Chimney Coping Stone		LF					
	Cast Window Sills		LF					
	Precast Lintel		LF					
	Remove, Salvage & Reinstall Face Brick @ Window Removals		SF					
	Parapet Brick Replacement - ALLOW 10% of Area		SF					
	Subtotal							
04510	MASONRY CLEANING							
	Clean Brick Façade		SF					
	Subtotal							
04515	MASONRY RESTORATION AND TUCK POINTING							
	Repoint Brick Façade		SF					
	Repoint Chimney		LS					
	Repoint Brick Parapets		SF					
	Subtotal							
<u>05.0000</u>	METALS							
05500	MISCELLANEOUS METALS							
	1/4" Thick Alu Plate Ceiling		SF					
	1/4" Alu Trim @ Window Heads, Jamb & Sill		SF					
	1/8" Alu Plate Kick		LF					
	1/4" Brushed Stainless Plate w/ Letter Etching @ Book Drop		SF					
	Aluminum Panel @ Wall		SF					
	Custom Metal Filler Panel @ Pipe		EA					

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Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Perforated Metal Screen with Text Cutouts - ALLOW (Main Entry Sign)		SF					
	Corrugated Metal Screen @ HVAC Enclosure		SF					
	Corrugated Metal Screen @ Canopy		SF					
	Pin Mid Letters on Garden Wall		EA					
	Corrugated Steel Gate @ HVAC Enclosure		EA					
	New Drainage Leader		LF					
	Radiator Grilles/Covers		LF					
	HVAC Grille @ Wall - ALLOW		SF					
	Subtotal							
05600	METAL FRAMING							
	Structural Steel Support @ New Storefront		LBS					
	Roof Top Enclosure Structural Steel		LBS					
	Curved Steel Backup @ Roof Top Enclosure		LBS					
	Unistrut Framing Including Fittings @ Corrugated Metal Screen @ Canopy		LF					
	Hilti Epoxy Bolts For Unistrut Channel @ Existing Masonry Wall		EA					
	Lintel @ New Masonry Opening		LF					
	Subtotal							
06 0000	WOOD, PLASTICS, AND COMPOSITES							
06200	CARPENTRY							
	Blocking for New Coping		LF					
	Metal Framing, Plywood, Alu Panel		SF					
	Bamboo Panel @ Book Drop Closet		SF					
	Wood Blocking/Nailers For Unistrut Framing @ Canopy		LF					
	Lag Bolts @ Wood Blocking For Unistrut Framing		EA					
	Closet Poles & Shelves		LF					
	Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Ufca Avenue, Brooklyn NY 11203
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DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
06400	ARCHITECTURAL WOODWORK							
	Glass Backsplash Over Bamboo		SF					
	Base Cabs w/ Counter @ Kitchenette		LF					
	Wall Cabs w/ Sliding Door @ Kitchenette		LF					
	Workstation Counter		LF					
	Workroom Shelving		LF					
	Patron Interface Counter w/ Base Cabinets		LF					
	Base Cabinets w/ Sliding Doors & Aluminum Top Customer Service Desk		LF					
	Subtotal							
07000 07130	THERMAL AND MOISTURE PROTECTION							
	SHEET MEMBRANE WATERPROOFING							
	Waterproofing @ New Foundation Wall/SOG		SF					
	Waterproofing @ Masonry Infill		SF					
	Vapor Barrier @ Plaster Canopy Soffit		SF					
	Subtotal							
07210	BUILDING INSULATION							
	10" Batt Insulation @ Plaster Canopy Soffit		SF					
	Subtotal							
07211	PERIMETER FOUNDATION INSULATION							
	Insulation @ New Foundation Wall/Slab		SF					
	Subtotal							

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Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
07270	FIRESTOPS AND SMOKESEALS Firestopping		SF					
	Subtotal							
07420	ZINC CLADDING AND TRIM Coping @ Parapet SS Thru Wall Flashing @ Parapet Fascia @ Canopy		LF LF LF					
	Subtotal							
07500	FLUID APPLIED MEMBRANE ROOFING SYSTEM Proprietary Item: Kemper System America's Kemperol 2K-PUR Component A		SF					
	Subtotal							
07700	ROOF SPECIALTIES Zinc Scuppers Chimney Flashing, Base & Cap Cap Flashing in New Reglet @ Canopy Roof		EA LF LF					
	Subtotal							
07720	ROOF ACCESSORIES Roof Walkway Pads Roof Hatch		SF EA					
	Subtotal							
07900	JOINT SEALERS Misc Caulk & Sealant		SF					
	Subtotal							

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07910	MISCELLANEOUS JOINT FILLERS (Included w/ 07900)							
<u>08.0000</u>	<u>DOORS AND WINDOWS</u>							
08100	Steel Doors & Frames							
	3-0 x 8-0 - Type A		EA					
	3-0 x 6-8 - Type A		EA					
	2-8 x 8-0 - Type A		EA					
	3-0 x 8-0 - Type B (Fixed Transom)		EA					
	3-0 x 8-0 - Type E - ALLOW		EA					
	(2) 2-0 x 8-0 Closet Door		PR					
	Subtotal							
08214	DOORS - SPECIAL FABRICATION							
	Children's Area Door		PR					
	Work Room Door		EA					
	Subtotal							
08300	ACCESS DOORS							
	Remove & Replace Floor Access Hatch		EA					
	Subtotal							
08520	ALUMINUM WINDOWS							
	Aluminum Windows		SF					
	Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
08700	FINISH HARDWARE Proprietary Items: Set 1 Set 2 Set 3 Set 4 Set 5 Set 6A Set 6B Set 7 Set 8 Set 9 Set 10							
			EA					
			EA					
			EA					
			EA					
			EA					
			EA					
			EA					
			EA					
			EA					
			EA					
	Subtotal							
08800	GLASS AND GLAZING Sidelite Glazing (Exterior) Interior SF Glazing							
			SF					
			SF					
	Subtotal							
08840	PLASTIC HONEYCOMB COMPOSITE GLAZING Luminescent Panel - ALLOW Luminescent Panel @ Customer Svc Desk - ALLOW							
			SF					
			SF					
	Subtotal							

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
08910	ALUMINUM ASSEMBLIES Vestibule Glazing Glass Ceiling @ Vestibule (2) 3-0 x 8-0 Alu/Glass Doors 3-0 x 9-0 Alu/Glass Door 3-0 x 8-0 Alu/Glass Door		SF					
			SF					
			PR					
			EA					
			EA					
	Subtotal							
08955	CHANNEL GLASS FAÇADE Channel Glass		SF					
		Subtotal						
09 0000 09200	FINISHES LATHING AND PLASTERING Plaster Soffit Plaster Finish on Existing Column							
			SF					
			SF					
		Subtotal						
09205	LATHING AND CEMENT PLASTERING (included w/ 09200)							
09250	GYPSUM DRYWALL Shade Pockets Repair Gyp Ceilings Replace 2x2 ACT Dropped Soffit & Fascia		LF					
			SF					
			SF					
			SF					

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
09310	Partitions							
	Type 1 & 1A Partition - 4" Mtl Stud, 2 Layers Gyp Each Side, Sound Batt		SF					
	Type 2 Partition - 4" Mtl Stud, 1 Layer GypBd Each Side, Sound Batt		SF					
	Type 6 Furring		SF					
	Subtotal							
09660	TILE							
	Tile Floor @ Elec/Storage		SF					
	Wall Tile		SF					
	Stone Saddle		EA					
	Stone Floor		SF					
Subtotal								
09685	RESILIENT TILE FLOORING							
	Cork Rubber Tile		SF					
	Vinyl Base		LF					
Subtotal								
09720	TILE CARPETING (Included w/ 09310, 09660, & 09720)							
	DIGITAL PRINT WALL COVERING							
	Digital Print Wall Covering		SF					
Subtotal								
09900	PAINING AND FINISHING							
	Paint Walls		SF					
	Paint Ceilings		SF					

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Paint Door Frames		EA					
	Scrape & Paint Extg Lintels		LF					
	Misc. Local Restoration - ALLOW		LS					
	Subtotal							
10 0000	SPECIALTIES							
10350	FLAGPOLE							
	Flagpole		LS					
	Subtotal							
10400	IDENTIFYING DEVICES							
	Signage - ALLOW		LOC					
	1/4" Thick Alu Sign w/ Laser Cut "Information" - ALLOW		LS					
	Subtotal							
10416	TACK BOARDS							
	Fabric Tack Board		SF					
	Tackboard @ Vestibule		SF					
	Subtotal							
10500	LOCKERS							
	Thru Wall Book Drop		LS					
	Subtotal							
10522	FIRE EXTINGUISHERS AND CABINETS							
	Recessed FEC		EA					
	Surface Mtd FEC		EA					
	Subtotal							

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10670	STORAGE SHELVING Shelving Unit @ Electrical Rm		EA					
	Subtotal							
10800	TOILET ACCESSORIES Soap Dispenser TP Holder Grab Bar Mirror		EA EA EA EA					
	Subtotal							
<u>11 0000</u>	EQUIPMENT							
11450	APPLIANCES AND EQUIPMENT Refrigerator Microwave Video Wall		EA EA LS					
	Subtotal							
<u>12 0000</u>	FURNISHINGS							
12501	CHAIN AND CLUTCH OPERATED WINDOW SHADES Chain & Clutch Operated Window Shades		SF					
	Subtotal							
12690	FLOORS MATS AND FRAMES Alu Entrance Mat		SF					
	Subtotal							

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15 0000	MECHANICAL							
15010	General Provisions for Mechanical, Plumbing, and Fire Protection Work							
	Temporary Heat		LS					
	Valve Tags, Pipe Identification		LS					
	Subtotal							
15050	Basic Mechanical Materials and Methods							
	Escutcheons		LS					
	Dielectric Fittings		LS					
	Concrete Housekeeping Pads		EA					
	Small Bore Pipe Demolition		LF					
	Fln Tube Radiation Demolition		EA					
	Split Air Handling Unit Demolition w/ Condensing Units		EA					
	Exhaust Fan Demolition		EA					
	Cabinet Unit Heater Demolition		EA					
	Medium Sized Duct Demolition		LF					
	Small Sized Duct Demolition		LF					
	Subtotal							
15060	Hangers and Supports							
	Hangers		EA					
	Subtotal							
15110	Valves							
	150# Bronze Ball Valves		EA					
	150# Bronze Check Valves		EA					
	150# Bronze Balancing Valves		EA					
	150# Bronze 3 Way Control Valves		EA					
	Self Contained Control Valves		EA					

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	150# Bronze Drain Valves		EA					
	Automatic Air Vents		EA					
	Manual Air Vents		EA					
	150# Bronze Strainers		EA					
	Subtotal							
15121	Piping Expansion Compensation Expansion Joints		EA					
	Subtotal							
15135	Gauges and Meters Pressure Gauges Thermometers		EA EA					
	Subtotal							
15140	Supports and Anchors Roof Duct Supports		EA					
	Subtotal							
15171	Enclosed Motor Controllers Magnetic Motor Starters		EA					
	Subtotal							
15181	Hydronic Piping and Pipe Fittings Heating Hot Water Piping 2" L Copper Tubing		LF					

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	1" L Copper Tubing		LF					
	3/4" L Copper Tubing		LF					
	Wrought Copper Fittings		EA					
	Solder, Flux, Gas, Etc.		LS					
	Subtotal							
15245	Vibration Isolation Air Handling Unit Vibration Stands		EA					
	Subtotal							
15260	Piping Insulation Fiberglass Pipe Insulation Elastomeric Pipe Insulation		LF LF					
	Subtotal							
15290	Ductwork Insulation 1 1/2" Duct Wrap 1" Thk Duct Board		SF SF					
	Subtotal							
15530	Refrigerant Piping 2 1/8" ACR Tubing 7/8" ACR Tubing 3/8" ACR Tubing Wrought Copper Fittings Silver Braze, Gas, Nitrogen, Etc.		LF LF LF EA LS					

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Sponsor Agency: Brooklyn Public Library

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15611	Air Conditioning Condensate Piping							
	1" L Copper Tubing		LF					
	Wrought Copper Fittings		EA					
	Solder, Flux, Gas, Etc.		LS					
	Subtotal							
15738	Electric Heating							
	EWI 1,2,3 Electric Wall Heaters 4 KW		EA					
	Split System Air Conditioning Units							
	AC 1 Split System Air Conditioning Unit 10,000 CFM w/ DX, HW Coils, 2 Condensing Units		EA					
AC 2 Split System Air Conditioning Unit 1,000 CFM w/ DX, HW Coils, Condensing Unit		EA						
CP 1,2 Air Conditioning Condensate Pumps 20 GPH @ 20 Ft, 1/30 HP		EA						
	Subtotal							
15761	Hot Water Coils							
	UH 1 Hydronic Unit Heater 84.9 MBH		EA					
	CUH 1 Hydronic Cabinet Unit Heater 38 MBH		EA					
	Subtotal							
15764	Convection Heating Units							
	R1,2,3 Pedestal Fin Tube Radiation 900 MBH /Ft		LF					
	R4,5 Wall Mounted Fin Tube Radiator 900 MB/ Ft		LF					
	Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
 Location: 1000 Utica Avenue, Brooklyn NY 11203
 Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
15765	Rectangular Duct Bypass Box							
	BPB 1 VAV Box 10" Inlet		EA					
	BPB 2 VAV Box 8" Inlet		EA					
	BPB 3 VAV Box 6" Inlet		EA					
	Subtotal							
15792	Acoustic Treatment							
	1" Thk Duct Liner		SF					
	Subtotal							
15822	Air Monitoring and Detection							
	Duct Smoke Detectors		EA					
	Subtotal							
15860	Centrifugal Fans							
	RF 1 Inline Fan 10,000 CFM @ 1", 5 HP		EA					
	RF 2 Inline Fan 1,000 CFM @ .375", 786 Watts		EA					
	EX 1 Inline Fan 225 CFM @ .3", 1/6 HP		EA					
	Subtotal							
15861	Air Filters (Included w/ 15738)							
15890	Duct Work							
	Galvanized Ductwork		LBS					
	Air Conditioning Unit Drip Pans		EA					
	Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
 Location: 1000 Ufca Avenue, Brooklyn NY 11203
 Bidder:

DDC ID: LBKA05RUG
 Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
15900	HVAC Instrumentation and Controls (Proprietary Item)							
	Proprietary Item:							
	HVAC BMS Honeywell System - Facility Management and Control System (FMCS) shall be based on the Honeywell WEBs System incorporating the Niagara Framework							
	EWB 1,2,3 Electric Wall Heaters 4 KW		PTS					
	RF 1 Inline Fan 10,000 CFM @ 1", 5 HP		PTS					
	RF 2 Inline Fan 1,000 CFM @ .375", 786 Watts		PTS					
	EX 1 Inline Fan 225 CFM @ .3", 1/6 HP		PTS					
	UH 1 Hydronic Unit Heater 84.9 MBH		PTS					
	AC 1 Split System Air Conditioning Unit 10,000 CFM w/ DX, HW Coils, 2 Condensing Units		PTS					
	AC 2 Split System Air Conditioning Unit 1,000 CFM w/ DX,HW Coils, Condensing Unit		PTS					
	CUH 1 Hydronic Cabinet Unit Heater 38 MBH		PTS					
	BPB 1 VAV Box 10" Inlet		PTS					
	BPB 2 VAV Box 8" Inlet		PTS					
	BPB 3 VAV Box 6" Inlet		PTS					
Subtotal								
15910	Ductwork Accessories							
	Canvas Flexible Connections		EA					
	Fire Dampers		SF					
	Fire Smoke Dampers		EA					
	Motorized Dampers		EA					
	Wire Mesh Screens		EA					
	Gravity Ventilators		EA					
Cable Operated Dampers		EA						
Volume Dampers		EA						

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Utica Avenue, Brooklyn NY 11203
Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description.	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor	
	Drop Shield		EA						
	Flexible Duct/ Preinsulated		EA						
	Roof Curbs		EA						
	Subtotal								
15940	Air Outlet and Inlets								
	Supply Air Diffusers		EA						
	Exhaust Air Grilles		EA						
	Transfer Air Grilles		EA						
	Return Air Grilles		EA						
	Layin Return Air Grille		EA						
	Subtotal								
15985	Sequence of Operation								
	EWB 1,2,3 Electric Wall Heaters 4 KW		PTS						
	RF 1 Inline Fan 10,000 CFM @ 1", 5 HP		PTS						
	RF 2 Inline Fan 1,000 CFM @ .375", 786 Watts		PTS						
	EX 1 Inline Fan 225 CFM @ .3", 1/6 HP		PTS						
	UH 1 Hydronic Unit Heater 84.9 MBH		PTS						
	AC 1 Split System Air Conditioning Unit 10,000 CFM w/ DX, HW Coils, 2 Condensing Units		PTS						
	AC 2 Split System Air Conditioning Unit 1,000 CFM w/ DX, HW Coils, Condensing Unit		PTS						
	CUH 1 Hydronic Cabinet Unit Heater 38 MBH		PTS						
	BPB 1 VAV Box 10" Inlet		PTS						
	BPB 2 VAV Box 8" Inlet		PTS						
	BPB 3 VAV Box 6" Inlet		PTS						
		Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Utica Avenue, Brooklyn NY 11203
Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
15990	Testing, Adjusting, and Balancing Testing, Adjusting, and Balancing		MH					
	Subtotal							
<u>P15 0000</u>	PLUMBING							
P15052	Common Work Results for Plumbing							
	Floor Sleeves		EA					
	Exterior Wall Sleeves		EA					
	Escutcheons		EA					
	Roof Drain Demolition		EA					
	Medium Pipe Demolition		LF					
	Subtotal							
P15061	Hangers and Supports for Plumbing Piping Hangers		EA					
	Subtotal							
P15073	Vibration and Seismic Controls for Plumbing Piping Vibration and Seismic Control for Plumbing Piping and Equipment		LS					
	Subtotal							
P15076	Identification for Plumbing Piping Valve Tags, Pipe Identification		LS					
	Subtotal							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid

Location: 1000 Utica Avenue, Brooklyn NY 11203

Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
P15082	Plumbing Insulation Fiberglass Pipe Insulation Roof Drain Sump Insulation		LF					
			EA					
	Subtotal							
P15141	Domestic Water Piping		LF					
			LF					
			LF					
			EA					
			EA					
			EA					
			LS					
	Subtotal							
P15150	Sanitary Waste and Vent Piping		LF					
			LF					
			EA					
			LS					
			Subtotal					

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Ullica Avenue, Brooklyn NY 11203
Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
P15160	Storm Drainage Piping 4" No Hub Cast Iron Pipe No Hub Cast Iron Fittings No Hub Couplings, Etc.		LF					
			EA					
			LS					
			Subtotal					
P15165	Storm Drainage Piping Specialties Roof Drain		EA					
			Subtotal					
P15183	Electrical Piping Heating Cable Electrical Piping Heating Cable w/ Module		LF					
			Subtotal					
P15410	Plumbing Fixtures Wall Hung Lavatories Drinking Fountain Kitchen Sinks Floor Mounted Water Closet w/ Flushometer Lavatory Carriers		EA					
			EA					
			EA					
			EA					
			EA					
			Subtotal					

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Utica Avenue, Brooklyn NY 11203
Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
16 0000	ELECTRICAL/ FIRE ALARM							
16010	General Provisions for Electrical Work		LS					
	Temp Power and Lighting		LS					
	Misc Demo		EA					
	Remove Panel, short feeder							
	Subtotal							
16060	Grounding and Bonding (Included w/ 16120)							
16120	Wire and Cables 600 Volts and Below							
	MC Cable		LF					
	Subtotal							
16130	Racways, Boxes, and Fittings							
	3/4" Emt, 4#12		LF					
	3/4" Rigid, 4#12		LF					
	3/4" Emt, 8#12		LF					
	Chop Floor		LF					
	3/4" Emt, 4#12		LF					
	3/4" Emt, 4#10		LF					
	1" Emt, 4#6		LF					
	1 1/4" Emt, 4#2		LF					
	1 1/2" Emt, 4#1		LF					
	2" Emt, 4 3/0		LF					
	Subtotal							
16140	Wire Devices							
	Switches		EA					
	Occupancy Sensor		EA					
	Vacancy Sensor		EA					

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Utica Avenue, Brooklyn NY 11203
Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Photo-electric Switch		EA					
	Duplex Receptacles		EA					
	Junc Boxes, Misc		EA					
	Receptacles GFI		EA					
	Receptacles Quad		EA					
	Time Clock, 3P Contactor		EA					
	Vertical Plugmold		EA					
	Floor Power Junc Box		EA					
	Floor Power Outlet		EA					
	Receptacles GFI WP		EA					
	Manual Snap Switch Starter, CP		EA					
	Power Furniture VWall to Floor In-feed		EA					
	Workstations		EA					
	Install Furniture Recept FBO		EA					
	Door Chime Backbox, Stubup		EA					
	Subtotal							
16195	Electrical Identification (Included w/ 16140)							
16220	Fire Alarm							
	Proprietary Item - Edwards System:							
	3/4" Emt, 4#12		LF					
	Teflon Cable		LF					
	Pull Station		EA					
	Audible/Visual		EA					
	Smoke Detector		EA					
	Heat Detector		EA					
	CO Detector		EA					
	Duct Detector		EA					

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Utica Avenue, Brooklyn NY 11203

DDC ID: LBKA05RUG

Bidder: Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Strobe		EA					
	Doo Release		EA					
	Central Equipment		EA					
	Fu Cutout		EA					
	Misc Connections		EA					
	FSD Connections, 120v		EA					
	1-Day Walk Thru, Test		LS					
	Subtotal							
16442	Panelboards							
	100 Amp Panel Board, temp trailer		EA					
	100 Amp Panel Board		EA					
	225 Amp Panel Board		EA					
	Term @ Exist Panel Board		EA					
	20/2 Amp Disconnect		EA					
	30/2 Amp Disconnect		EA					
	30 Amp Disconnect		EA					
	60 Amp Disconnect		EA					
	100 Amp Disconnect		EA					
	200 Amp Fuse		EA					
	Subtotal							
	LIGHTING FIXTURES							
	Type A		EA					
	Type B		EA					
	Type C1		EA					
	Type F		EA					
	Type I Picture Lt		EA					
	Relocate exist fixture		EA					
	Exit		EA					

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Utica Avenue, Brooklyn NY 11203
Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	Type H exterior		EA					
	Type J exterior		EA					
	Type K exterior		EA					
	Type D1		LF					
	Type D2		LF					
	Type G1,2,3		LF					
	Type G4		LF					
	Type E2		LF					
	Type UC LED		LF					
	Subtotal							
16 0000	SECURITY/ TELECOM							
16750	Telecom Cabling System							
	Install Tel Cabinet FBO		EA					
	Ground Bar		EA					
	Term Boards		EA					
	3/4" Emt, VGA Cable		LF					
	1" EMT Cdt		LF					
	1 1/2" EMT CDT		LF					
	WAP Outlet		EA					
	Data Outlet Backbox w/ Stubup		EA					
	Tel Outlet Backbox w/ Stubup		EA					
	Tel/Data Outlet Backbox w/ Stubup		EA					
	Floor T/D Outlet		EA					
	T/D Furniture Wall/Floor In-feed		EA					
	Install Furniture Backbox FBO		EA					
	Subtotal							
16751	Telecom Pathways System (Included w/ 16750)							

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CONTRACT 1 - GENERAL CONSTRUCTION WORK

Project: Renovation of the Rugby Branch Library Re-Bid
Location: 1000 Utica Avenue, Brooklyn NY 11203
Bidder:

DDC ID: LBKA05RUG

Sponsor Agency: Brooklyn Public Library

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
16800	Electronic Security System							
	Proprietary Item - LIF Security (Continental) Card Access:							
	Door Contact		EA					
	Keypad		EA					
	Power Supplies		EA					
	Proprietary Item - LIF Security (NAPCO) Security Alarm System:							
	Plenum Cable		LF					
	Coax Cable		LF					
	3/4" Emt, 4#12		LF					
	3/4" EMT Cdt		LF					
	Security Wallfield, wireways		LS					
	Intrusion Alarm Panel		EA					
Motion Sensor		EA						
Line Surge Supp		EA						
Proprietary Item (CCTV System):								
CCTV Camera		EA						
CCTV Monitoring & Recording Eqpt		LS						
	Subtotal							
TOTAL CONTRACT 1 - GENERAL CONSTRUCTION WORK								

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**ATTACHMENT 1 - BID INFORMATION
PROJECT ID: LBKA05RUG**

DESCRIPTION AND LOCATION OF WORK:

Renovation of the Rugby Branch Library (Re-bid)
1000 Utica Avenue,
Brooklyn, NY 11203
E-PIN: 85016B0074 / DDC PIN: 8502016LB0002C

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: **TUESDAY, MARCH 8, 2016**

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:	TUESDAY, MARCH 8, 2016 AT 2:00 PM
	LATE BIDS WILL NOT BE ACCEPTED

PRE-BID WALK-THRU AND CONFERENCE:

PLACE	Rugby Branch Library 1000 Utica Avenue Brooklyn, NY 11203
DATE AND HOUR	WEDNESDAY, FEBRUARY 24, 2016 AT 10:00 AM
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 the amount of \$1,000,000.00 or more. 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) 391-1016 or (718) 391-1604 Fax: (718) 391-2615

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**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 _____ YES _____ NO

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</u> RATE	<u>INTERSTATE</u> RATE
_____	_____	_____
_____	_____	_____
_____	_____	_____

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:

YES NO Contractor has received a willful violation issued by OSHA or New York City Department of Buildings (NYCDOB) within the last three years.

YES NO Contractor has had an incident requiring OSHA notification within 8 hours (all work-related fatalities) or an incident requiring OSHA notification within 24 hours (all work-related inpatient hospitalizations, all amputations and all losses of an eye).

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.

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

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)

YES NO Contractor previously audited by the DDC Office of Site Safety.
 DDC Project Number(s): _____, _____, _____

YES NO Accident on previous DDC Project(s).
 DDC Project Number(s): _____, _____, _____

YES 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].
 DDC Project Number(s): _____, _____, _____

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 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: _____

THIS PAGE INTENTIONALLY LEFT BLANK

**DIRECTIONS: Please execute two originals (both with original signature).
Please forward directly to the agency (not M.O.C.S.).**



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: _____

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

**DIRECTIONS: Please execute two originals (both with original signature).
Please forward directly to the agency (not M.O.C.S.).**

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: _____

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

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
___ Disadvantaged Business Enterprise	
- 2a. If you are certified as an **MBE, WBE, LBE, EBE** or **DBE**, 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 ___
5. Are you a Union contractor? Yes ___ No ___ If yes, please list which local(s) you affiliated with _____
6. Are you a Veteran owned company? Yes ___ No ___

PART I: CONTRACTOR/SUBCONTRACTOR INFORMATION

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

13. Number of employees in your company: _____

14. Contract information:

(a) _____ (b) _____
Contracting Agency (City Agency) Contract Amount

(c) _____ (d) _____
Procurement Identification Number (PIN) Contract Registration Number (CT#)

(e) _____ (f) _____
Projected Commencement Date Projected Completion Date

(g) Description and location of proposed contract:

15. 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.

16. 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.

17. 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: _____

18. 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.

19. 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

20. 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?

21. 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___ |

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

23. 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.

24. 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.

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

- ___ Minorities and Women
- ___ Individuals with handicaps
- ___ Other. Please specify _____

26. 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.

27. 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.

28. 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.

29. 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).

30. 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).

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

FORM A. CONTRACT BID INFORMATION: USE OF SUBCONTRACTORS/TRADES

1. Do you plan to subcontract work on this contract? Yes ___ No ___
2. If yes, complete the chart below.

NOTE: All proposed subcontractors with a subcontract in excess of \$750,000 must complete an Employment Report for review and approval before the contract may be awarded and work commences.

SUBCONTRACTOR'S NAME*	OWNERSHIP (ENTER APPROPRIATE CODE LETTERS BELOW)	WORK TO BE PERFORMED BY SUBCONTRACTOR	TRADE PROJECTED FOR USE BY SUBCONTRACTOR	PROJECTED DOLLAR VALUE OF SUBCONTRACT

*If subcontractor is presently unknown, please enter the trade (craft name).

OWNERSHIP CODES

- W: White
- B: Black
- H: Hispanic
- A: Asian
- N: Native American
- F: Female

FORM B: PROJECTED WORKFORCE

TRADE CLASSIFICATION CODES

- (J) Journeylevel Workers
- (H) Helper
- (TOT) Total by Column
- (A) Apprentice
- (TRN) Trainee

For each trade to be engaged by your company for this project, enter the projected workforce for Males and Females by trade classification on the charts below.

Trade:	MALES						FEMALES														
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		
	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	
J																					
H																					
A																					
TRN																					
TOT																					

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM B: PROJECTED WORKFORCE

Trade: _____

Union Affiliation, if applicable _____

Total (Col. #1-10): _____

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10): _____

Total Female
(Col. #6 - 10): _____

MALES

(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.

J

H

A

TRN

TOT

FEMALES

(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

TRADE CLASSIFICATION CODES

- (J) Journeylevel Workers
- (H) Helper
- (TOT) Total by Column
- (A) Apprentice
- (TRN) Trainee

For each trade currently engaged by your company for all work performed in New York City, enter the current workforce for Males and Females by trade classification on the charts below.

Trade: _____

Union Affiliation, if applicable _____

Total (Col. #1-10): _____

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10): _____

Total Female
(Col. #6 - 10): _____

	MALES					FEMALES														
	(1)		(2)		(3)	(4)		(5)		(6)		(7)		(8)	(9)		(10)			
	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	Hisp.	Asian	Native Amer.	White Non Hisp.	Black Non Hisp.	White Non Hisp.	Black Non Hisp.	Hisp.	Asian	Native Amer.	White Non Hisp.	Black Non Hisp.	Hisp.	Asian	Native Amer.	
J																				
H																				
A																				
TRN																				
TOT																				

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

Trade: _____

Union Affiliation, if applicable _____

Total (Col. #1-10): _____

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10): _____

Total Female
(Col. #6 - 10): _____

MALES

(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.

J
H
A
TRN
TOT

FEMALES

(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?



FMS ID: LBKA05RUG



Department of Design and Construction

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

Renovation of the Rugby Branch
Library Re-Bid

LOCATION: 1000 Utica Avenue
BOROUGH: Brooklyn 11203
CITY OF NEW YORK

Contractor _____

Dated _____, 20____

Entered in the Comptroller's Office _____

First Assistant Bookkeeper _____

Dated _____, 20____





Department of Design and Construction

PROJECT ID: LBKA05RUG

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

**Renovation of the Rugby Branch
Library Re-Bid**

LOCATION:
BOROUGH:
CITY OF NEW YORK

1000 Utica Avenue
Brooklyn 11203

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

Brooklyn Public Library

Locascio Architect



Date: November 23, 2015

6-085





**Department of
Design and
Construction**

**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**





2015 Project Labor Agreement

NOTICE: THIS CONTRACT IS SUBJECT TO A NEW PROJECT LABOR AGREEMENT EXECUTED IN 2015

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.

In addition, please note that there are significant revisions between the 2015 PLA attached to this bid and the prior Citywide Renovation PLA. The Contractor is urged to review the entire PLA. Significant changes include:

- **Micro Work Orders:** For JOCS and Requirements contracts, Task Orders or Work Orders that do not exceed \$10,000 are not subject to the PLA. See PLA Article 3, Section 1.
- **On Call Contracts:** Provisions have been added regarding the referral of workers for on call contracts where Contractors are required to respond on an expedited basis. See PLA Article 4, Section 8.
- **Grievances:** The grievance procedure governing disputes under the PLA has been clarified. See PLA Article 9, Section 1.
- **Delinquent Contractors:** Contractors and Subcontractors who do not make required payments to union funds on a timely basis are subject to requirements to submit cancelled checks or another form of proof of payment in addition to certified payroll reports when requesting payment. See PLA Article 11, Section 2.
- **Payment to Union Funds for Non-Union Workers:** Non-union Contractors with bona fide private benefit plans that satisfy the requirements of Labor Law 220 will not be required to pay into union benefit funds for “core” non-union employees (working pursuant to Article 4, Section 2 of the PLA) who are already covered under such bona fide private benefit plans. See PLA Article 11, Section 2.
- **Veterans Day:** Veterans Day has been added to the list of standard holidays. See Article 12, Section 4.
- **Reporting Pay for Weather Events:** The usual reporting pay requirement of two hours for employees who report to their work location pursuant to their regular schedule does not apply when the National Weather Service issues a Weather Advisory and the Contractor speaks to the employee at least four hours before their shift starting time. See Article 12, Section 6.

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 week, 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 implemented pursuant to New York City Administrative Code §6-129, 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 certified M/WBE firms may be obtained from the Department of Small Business Services (DSBS) website at www.nyc.gov/getcertified, by emailing DSBS at MWBE@sbs.nyc.gov, by calling the DSBS certification hotline at (212) 513-6311, or by visiting or writing DSBS at 110 William St., 7th floor, New York, New York, 10038.

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.

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

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

1. **Q.** 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.
2. **Q.** 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.
3. **Q.** Do the provisions of the PLA apply equally to subcontractors as well as contractors and how does the PLA affect the subcontractors that a bidder may utilize on the project?
A. Yes, the PLA applies to subcontractors and all subcontractors must agree to become party to the PLA. See PLA Art. 2, Sec. 8. 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.
4. **Q.** 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.
5. **Q.** 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 M/WBEs 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 M/WBEs 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 M/WBEs, 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.
6. **Q.** Must the City set M/WBE participation goals for the particular project or contract in order for a certified M/WBE to utilize the provisions of PLA Article 4, Section 2C?
A. No. PLA Article 4, Section 2(C) specifies what categories of M/WBEs are eligible to take advantage of this provision (i.e., those M/WBEs 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.

7. **Q.** 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.

8. **Q.** Does a non-union employee working under the PLA automatically become a union member?
 - 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 except in certain circumstances as set forth in the PLA. See PLA Article 4, Section 6 and Article 11.

9. **Q.** When will the agency shop dues payer affiliate workers become eligible for union benefits?
 - A. Union benefit plans have their own plan documents that determine eligibility and workers will become eligible for certain benefits at different points in time. Contractors who will have agency shop dues payer affiliate workers should speak with the respective union(s) as to benefit eligibility thresholds.

10. **Q.** 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. Except in certain circumstances, as described in the following paragraph, 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 D.

Non-union Contractors with bona fide private benefit plans that satisfy the requirements of Labor Law 220 will not be required to pay into union benefit funds for their employees working pursuant to Article 4, Section 2 (B) and (C) ("core" employees) who are already covered under their bona fide private benefit plans. Supplemental benefit funds in excess

of the annualized value of the private benefit plans will be paid to workers as additional wages in compliance with Labor Law 220. At the time of contract award, the Contractor shall make available to the contracting Agency a complete set of plan documents for each private benefit plan into which contributions will be made and/or coverage provided. The Contractor shall also provide certification from a certified public accountant as to the annualized hourly value of such benefits consistent with the requirements of Section 220. See PLA Article 11, Section 2.

11. Q. 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.

Upon notification by a union or fringe benefit fund that a Contractor is delinquent in its payment of benefits and a determination by the Agency that the union or fund has submitted appropriate documentation of such delinquency, the Agency will thereafter require the Contractor to submit cancelled checks or other equivalent proof of payment of benefit contributions with certified payroll reports for work covered by this PLA on which the Contractor is engaged.

The City strongly advises Contractors to read these provisions carefully and to include appropriate provisions in subcontracts addressing these possibilities.

12. Q. 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.

13. Q. Who decides on the number of workers needed?

A. Except as expressly limited by a specific provision of the PLA, a Contractor retains full and exclusive authority for the management of their operations, including the determination as to the number of employees to be hired and the qualifications therefore and the promotion, transfer, and layoff of its employees. See PLA Article 6, Section 1.

14. Q. May a contractor discharge a union referral for lack of productivity?

A. Again, except as expressly limited by a specific provision of the PLA, a Contractor retains full and exclusive authority for the management of their operations, including the right to discipline or discharge for just cause its employees. See PLA Article 6, Section 1.

15. Q. May a contractor assign a management person to site?

- A. Yes. Managers are not subject to the provisions of the PLA, so there is no restriction on management and/or other non-trade personnel, as long as such personnel do not perform trade functions. See Article 3, Section 1.
16. Q. 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). The standard work week may be reduced to 35 or 37 ½ hours of work in those limited circumstances where the City states in the bid documents that the Contractor will not be given access to the site to accommodate an 8 hour day. The 8 hour, 7 ½ hour or 7 hour work day must be established at the commencement of the project and may not be altered by the Contractor.
17. Q. Does the PLA create a common holiday schedule for all the signatory trades?
A. Yes, the PLA recognizes nine (9) common holidays, including Veterans Day. See PLA Article 12, Section 4.
18. Q. 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.
19. Q. 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 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.
20. Q. 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 trade's CBA.
21. Q. 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.
22. Q. 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.
23. Q. 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. The usual reporting pay requirement of two hours for employees who report to their work location pursuant to their regular schedule does not apply when the National Weather Service issues a Weather Advisory and the Contractor speaks to the employee at least four hours before their shift starting time. See PLA Article 12, Section 6.
24. Q. Should a local collective bargaining agreement of a signatory union 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.
25. Q. 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.
26. Q. 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.
27. Q. 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.
28. Q. 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.

29. Q. Does the 2015 Renovation PLA contain special provisions for JOCS or task order based Contracts?

A. The PLA does not apply to Task Orders or Work Orders that do not exceed \$10,000 issued under JOCS or Requirements Contracts otherwise subject to the PLA. See PLA Article 3, Section 1.

NYC Project Labor Agreements

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
Business Manager: Steve Ludwigson

BLASTERS & DRILLERS LOCAL NO. 29

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

BRICKLAYERS LOCAL NO. 1

4 Court Square #1
Long Island City, NY 11101
Phone: (718) 392-0525
Business Manager: Jeramiah Sullivan

CARPENTERS DISTRICT COUNCIL

395 Hudson Street, 9th Fl
New York, New York 10014
Phone: (212) 366-7500
Fax: (212) 675-3140
Business Manager: Joe Geiger
John Sheehy, D.C. Rep.

CEMENT MASONS NO. 780

150-50 14th Rd Suite 4
Whitestone, NY 11357
Phone: (718) 357-3750
Fax: (718) 357-2057
Business Manager: Gino Castingnoli

CONCRETE WORKERS DISTRICT COUNCIL NO. 16

29-18 35th Avenue
Long Island City, NY 11106
Phone: (718) 392-5077
Fax: (718) 392-5087
Business Manager: Alex Castaldi

DERRICKMEN AND RIGGERS LOCAL 197

35-53 24th Street
Long Island City, NY 11101
Phone: (718) 361-6534
Fax: (718) 361-6584
William Hayes Bus. Manager
Billhayes197@yahoo.com

DRYWALL TAPERS 1974

265 West 14th Street
New York, NY 10011
Phone: (212) 242-8500
Fax: (212) 242-2356
Business Manager: Sal Marsala

ELECTRICAL LOCAL NO. 3

158-11 Harry Van Arsdale, Jr. Avenue
Flushing, NY 11365
Phone: (718) 591-4000
Fax: (718) 380-8998
Business Manager: Chris Erickson
Raymond Melville, Asst. Bus. Mgr.
Construction

ELEVATOR CONSTRUCTORS NO. 1

47-24 27th Avenue
Long Island City, NY 11101
Phone: (718) 767-7004
Fax: (718) 767-6730
Business Manager: Lenny Legotte
llegotte@localoneiuec.com

ENGINEERS LOCAL UNION NO. 14

141-57 Northern Boulevard
Flushing, NY 11354
Phone: (718) 939-0600
Fax: (718) 939-3131
Business Manager: Edwin Christian

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

265 West 14th Street
New York, NY 10011
Phone: (212) 929-5327-8-9
Fax: (718) 729-3070
Business Manager: Tom Callahan

ENGINEERS NO. 30

115-06 Myrtle Avenue
Richmond Hill, NY 11418
Phone: (718) 847-8484
Fax: (718) 850-0524
Business Manager: William Lynn

ENGINEERS No. 94

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

GLAZIERS NO. 1087

45 West 14th Street
New York, NY 10011
Phone: (212) 924-5200
Fax: (212) 255-1151
Business Manager: Joseph Azzopardi

**HEAT & FROST INSULATORS
AND ALLIED WORKERS
LOCAL UNION NO. 12**

35-53 24th Street
Long Island City, NY 11101
Phone: (718) 784-3456
Fax: (718) 784-8357
Business Manager: Matty Aracich
matty@insulatorslocal12.com

**HEAT & FROST INSULATORS
LOCAL UNION NO. 12A**

1536 127th Street
College Point, NY 11356
Phone: (718) 886-7226
Business Manager: Jaime Soto

IRON WORKERS DISTRICT

505 White Plains Road, Suite 200
Tarrytown, NY 10591
Phone: (914) 332-4430
Fax: (914) 332-4431
Business Manager: Edward Walsh
iwnys@verizon.net

IRON WORKERS NO. 40 (Manhattan, The Bronx & Staten Island)

451 Park Avenue South
New York, NY 10016
Phone: (212) 889-1320
Fax: (212) 779-3267
Business Manager: Bob Walsh

IRON WORKERS NO. 361 (Brooklyn & Queens)

89-19 97TH Avenue
Ozone Park, NY 11416
Phone: (718) 322-1016-17
Fax: (718) 322-1053
Business Manager: Matthew Chartrand

**LABORERS LOCAL NO. 78
ASBESTOS & LEAD ABATEMENT**

30 Cliff Street
New York, New York 10038-2825
Phone: (212) 227-4803
Fax: (212) 406-1800
Business Manager: Edison Severino

**LABORERS, CONSTRUCTION AND
GENERAL BUILDING NO. 79**

520 8th Avenue
New York, NY 10018
Phone: (212) 465-7900
Fax: (212) 465-7903
Business Manager: Michael Prohaska

LABORERS NO. 731

34-11 35th Avenue
Astoria, NY 11106
(718) 706-0720
Business Manager: Joseph D'Amato

**LATHERS METAL
LOCAL NO. 46**

1322 Third Avenue
New York, NY 10021
Phone: (212) 737-0500
Fax: (212) 249-1226
Business Manager: Terrance Moore

MASON TENDERS DIST. COUNCIL

520 8th Avenue
New York, NY 10018
Phone: (212) 452-9400
Fax: (212) 452-9499
Business Manager: Robert Bonanza

**METAL POLISHERS
LOCAL UNION NO. 8A**

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

**MILLWRIGHT AND MACHINERY
ERECTORS LOCAL NO. 740**

89-07 Atlantic Avenue
Woodhaven, NY 11412
Phone: (718) 849-3636
Fax: (718) 849-0070
Business Manager: Joseph Geiger

**ORNAMENTAL IRON WORKERS
NO. 580**

501 West 42nd Street
New York, NY 10036
Phone: (212) 594-1662
Fax: (212) 564-2748
Business Manager: Pete Myers

**PAINTERS DISTRICT
COUNCIL NO. 9**

45 West 14th Street
New York, NY 10011
Phone: (212) 255-2950
Fax: (212) 255-1151
Business Manager: Joseph Ramaglia

**PAINTERS STRUCTURAL STEEL
NO. 806**

40 West 27th Street
New York, New York 10001
Phone: (212) 447-1838/0149
Fax: (212) 545-8386
Business Manager: Angelo Serse

**PAVERS & ROAD BUILDERS
DISTRICT COUNCIL NO. 1**

136-25 37TH Avenue, Suite 502
Flushing, NY 11354
Phone: (718) 779-8850
Fax: (718) 779-8857
Business Manager: Keith Lozcalzo

PLASTERS LOCAL UNION NO. 262

2241 Conner Street
Bronx, NY 10466
Phone: (718) 547-5440
Fax: (718) 547-5435
Business Manager: Michael Hubler

PLUMBERS NO. 1

158-29 Cross Bay Boulevard
Howard Beach, NY 11414
Phone: (718) 738-7500
Fax: (718) 835-0896
Business Manager: John Murphy

**PRIVATE SANITATION
LOCAL NO. 813**

45-18 Court Sq., Suite 600
Long Island City, NY 11101
Phone: (718) 937-7010
Fax: (718) 937-7003
Business Manager: Sean Campbell

ROOFERS & WATERPROOFERS NO. 8

12-11 43rd Avenue
Long Island City, NY 11101
Phone: (718) 361-1169
Fax (718) 361-8330
Business Manager: Nick Siciliano

**SHEET METAL WORKERS
LOCAL NO. 28**

MANHATTAN OFFICE
500 Greenwich Street
New York, NY 10013
Phone: (212) 941-7700
Fax: (212) 226-0304
Business Manager: Robert D'Orio

SHEET METAL WORKERS

LOCAL 137

21-42 44th Drive

Long Island City, NY 11101

Phone: (718) 937-4514

Fax: (718) 937-4113

Business Manager: Dante Dano

STEAMFITTERS LOCAL UNION

NO. 638

32-32 48th Avenue

Long Island City, NY 11101

Phone: (718) 392-3420

Fax: (718) 784-7285

Business Manager: Richard Roberts

TEAMSTERS LOCAL UNION 282

2500 Marcus Avenue

Lake Success, NY 11042

Phone: (516) 488-2822

Fax: (516) 488-4895

Business Manager: Tom Gesauldi

TEAMSTERS LOCAL UNION 814

21-42 44th Drive

Long Island City, NY 11101

Phone: (718) 609-6407

Fax: (718) 361-9610

Business Manager: Jason Ide

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

Business Manager: Tom Lane

TIMBERMEN LOCAL 1556

395 Hudson Street

New York, NY 10014

Phone: (212) 242-1320

Business Manager: Joseph Geiger

NYC AGENCY RENOVATION & REHAB OF CITY OWNED BUILDINGS/STRUCTURES
PLA

PROJECT LABOR AGREEMENT

COVERING SPECIFIED

**RENOVATION & REHABILITATION
OF CITY OWNED BUILDINGS AND STRUCTURES**

2015 - 2018

NYC AGENCY RENOVATION & REHAB OF CITY OWNED BUILDINGS/STRUCTURES
PLA

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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 desires to provide for the cost efficient, safe, quality, and timely completion of certain rehabilitation and renovation work ("Program Work," as defined in Article 3) in a manner designed to afford the lowest costs to the Agencies covered by this Agreement, 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 Program 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 Program Work;

(2) expediting the construction process and otherwise minimizing the disruption to the covered Agencies' 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 Program Work;

(4) standardizing the terms and conditions governing the employment of labor on Program 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;

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- (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 Program 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 City of New York, on behalf of itself and the Agencies covered herein, including in their 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.

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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 Program Work within the scope of this Agreement as defined in Article 3; "Agency" means the following New York City agencies: the Department for the Aging (DFTA), Administration for Children's Services (ACS), Department of Citywide Administrative Services (DCAS), Department of Correction (DOC), Department of Design and Construction (DDC), Fire Department (FDNY), Department of Homeless Services (DHS), Human Resources Administration (HRA), Department of Health and Mental Hygiene (DOHMH), Department of Parks and Recreation (DPR), Police Department (NYPD); Department of Sanitation (DSNY); the New York City Agency that awards a particular contract subject to this Agreement may be referred to hereafter as the "Agency"; when an 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 an Agency; the Building and Construction Trades Council of Greater New York and Vicinity is referred to as the ["BCTC" or "Council"]; and the work covered by this Agreement (as defined in Article 3) is referred to as "Program Work."

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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 mayor of the City of New York 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 Program 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 Program 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 applicable 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 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 Program Work, in whole or in part, except that Program Work which falls within the jurisdiction of the Operating

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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. The Collective Bargaining Agreements of the affiliated local unions that cover the particular type of construction work to be performed by the contractor, and as set forth in the Schedule A list of Agreements, shall be deemed the Schedule A Collective Bargaining Agreements ("Schedule A CBA") under this Agreement. Where association and independent Collective Bargaining Agreements for a particular type of construction work are both set forth in Schedule A, association members shall treat the applicable association agreement as the Schedule A CBA and independent contractors shall treat the applicable independent agreement as the Schedule A CBA. Subject to the foregoing, where a subject covered by the provisions of this Agreement is also covered by a Schedule A Collective Bargaining 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 Program 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 Program Work unless endorsed in writing by the 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

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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 Program 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 Program Work. It is further understood that the Agency or Construction Manager has sole discretion at any time to terminate, delay or suspend the Program Work, in whole or part, on any Program.

**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) Program 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 Program Work.

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SECTION 8. SUBCONTRACTING

Contractors will subcontract Program 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

Program Work shall be limited to designated rehabilitation and renovation construction contracts bid and let by an Agency (or its Construction Manager where applicable) after the effective date of this Agreement with respect to rehabilitation and renovation work performed for an Agency on City-owned property under contracts let prior to December 31, 2018. Subject to the foregoing, and the exclusions below, such Program Work shall mean any and all contracts that predominantly involve the renovation, repair, alteration, rehabilitation or expansion of an existing City-owned building or structure within the five boroughs of New York City. Examples of Program Work include, but are not limited to, the renovation, repair, alteration and rehabilitation of an existing temporary or permanent structure, or an expansion of above ground structures located in the City on a City-owned building. This Program Work shall also include JOCS contracts, demolition work, site work, asbestos and lead abatement, painting services, carpentry services, and carpet removal and installation, to the extent incidental to such building rehabilitation of City-owned buildings or structures.

It is understood that, except where the City specifically applies this Project Labor Agreement to such work in its bid documents, Program Work does not include, and this Project Labor Agreement shall not apply to, any other work, including:

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1. Contracts let and work performed in connection with projects carried over, recycled from, or performed under bids or rebids relating to work that were bid prior to the effective date of this Agreement or after December 31, 2018;
2. Contracts procured on an emergency basis;
3. Contracts that do not exceed \$250,000;
4. Contracts for work on streets and bridges and for the closing or environmental remediation of landfills;
5. Contracts with not-for-profit corporations where the City is not awarding or performing the work performed for that entity;
6. Contracts with governmental entities where the City is not awarding or performing the work performed for that entity;
7. 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 Program Work pursuant to this agreement;
8. Contracts for installation of information technology that are not otherwise Program Work;
9. Task Orders or Work Orders issued under JOCS or Requirements Contracts that do not exceed \$10,000, and JOCS or Requirements Contracts where the monetary value of such contracts predominantly involves such Task Orders or Work

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Orders; and

10. Contracts that do not exceed \$1 Million that are awarded pursuant to prequalified lists (PQLs) established by City agencies where entry on to the PQL is restricted to MWBEs, or a combination of MWBEs together with joint ventures which include at least one MWBE, or contractors who agree to subcontract at least 50% of the contract to MWBEs.

SECTION 2. TIME LIMITATIONS

In addition to falling within the scope of Article 3, Section 1, to be covered by this Agreement Program 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, 2018, 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 Program Work until completion, even if not completed by the expiration date of the Agreement. If Program 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 Program 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,

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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 Program site while covered Program 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 Program 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

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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 Program 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 Program 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 a listed 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 Program Work.

As the contracts involving Program 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.

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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 Program Work, with respect to that work.

SECTION 2. UNION REFERRAL

A. The Contractors agree to employ and hire craft employees for Program 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 Program Work within its jurisdiction from any source other than referral by the Union.

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B. A Contractor may request by name, and the Local will honor, referral of persons who have applied to the Local for Program Work and who meet the following qualifications:

- (1) possess any license required by New York State law for the Program 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 forth in 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 Program Work and who meet the following qualifications:

- (1) possess any license required by New York State law for the Program 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.

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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, FEMALE, LOCAL AND SECTION 3 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

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specifications, within 48 hours of the request for same, the Contractor may employ qualified minority or female applicants from any other available source.

In the event that the City or a City agency determines to adopt local workforce participation goals to be set forth in an Agency's (or, if applicable Construction Manager's) bid specifications, the City and BCTC will work together to seek agreement on appropriate goals to be set forth in applicable bid documents and to be subject to the provisions of this section.

For any Program Work that may become subject to requirements under Section 3 of the Housing and Urban Development Act of 1968, as amended by the Housing and Community Development Act of 1992, and any rules, including new or revised rules, that may be published thereunder, the Local Unions will acknowledge the Section 3 obligations of the Construction Manager or Contractor, as applicable, and agree to negotiate a method to implement this Article in a manner that would allow the Construction Manager or Contractor to meet its Section 3 obligations to the greatest extent feasible, and to post any required notices in the manner required by Section 3. The parties also acknowledge that the Construction Manager and Contractor may also fulfill its Section 3 requirements on Program Work by promoting opportunities for excluded employees, as defined by Article 3, Section 3 of this Agreement, on Program Work and, to the extent permitted by Section 3, by promoting opportunities for craft and other employees on non-Program Work.

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

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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 Program 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 Program Work. No employee shall be discriminated against at any Program 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.

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SECTION 8. ON CALL REPAIR REFERRALS

A. When an Agency awards a contract that requires the Contractor to have employees available on short notice to make time sensitive repairs with such contract requiring the Contractor to respond within as little as two hours from the time the Contractor is contacted by the Agency ("On Call, Repair Contract"), the Contractor will, within ten (10) days of being awarded an On Call, Repair Contract subject to this Agreement, notify the appropriate affiliated Union that it has been awarded such a contract and immediately enter into good faith negotiations with such relevant affiliated Union to establish a procedure to receive time sensitive referrals from such affiliated Union(s).

B. In the event the Contractor and the relevant affiliated Union(s) are unable to negotiate a specific, mutually agreeable procedure for on call repair referral procedure within twenty (20) days of commencement of negotiations or prior to commencement of performance of the contract, whichever is earlier, the Contractor and the relevant affiliated Unions will follow the following procedure:

1. Upon notification by a Contractor that it has been awarded an On Call Repair Contract pursuant to paragraph A above, each relevant affiliate Union shall provide the Contractor with the name and twenty four (24) hour contact information of an On Call, Repair Contract contact person for urgent on call repair referrals.

2. The relevant affiliated Unions shall prepare a list of individuals eligible and prepared for referral on an immediate basis to respond to the on call repair contractor. Such list shall be provided to and in the possession of the designated on call repair contact person for the affiliated Union and available for immediate reference.

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3. Individuals on such list must be able to comply with the Contractor's response time pursuant to contract requirements.

4. The Union's On Call, Repair Contract contact person shall respond to a contractor's request for referrals within a reasonable time of the request so that compliance with the contract shall be possible.

C. In the event that the Contractor makes a request for an on call referral that is compliant with this procedure and a Union is not able to respond to the request, that Union will be deemed to have waived the forty-eight (48) hour referral rule contained in Section 2 above and the Contractor may employ qualified applicants from any other available source that can meet contract requirements for that time sensitive on call repair work only; provided, however, that any work related to the repair work that is not of a time sensitive nature under the contract shall comply with Section 2. If a Union fails to timely refer a worker and the Contractor employs other workers, the Contractor will e-mail the agency within 72 hours and the agency will forward that e-mail to the designated Labor Management Committee contacts.

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 Program Work site during such time as bargaining unit work is occurring and subject to otherwise applicable policies pertaining to visitors to the site.

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SECTION 2. STEWARDS

A. Each Affiliated Union shall have the sole discretion to 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.

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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 Program 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 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,

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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 Program 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 Program Work site for any reason by any Union or employee against any Contractor or employer. There

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shall be no other Union, or concerted or employee activity which disrupts or interferes with the operation of the Program Work or the objectives of the Agency at any Program 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 Program Work site where the failure to cross disrupts or interferes with the operation of Program 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 Program 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

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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

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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 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.

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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 Program 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

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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. Grievances shall include the City contract number and the Program Work address; such information is posted at the Program Work Site if already commenced, and is available in the City Record and Notice to Proceed for projects not already commenced.

Grievances as to whether a scope of work is included or excluded from this Agreement shall be submitted to the Labor Management Committee (LMC) in the first instance rather than Step 1 below. To be timely, such notice must be given no later than ten days prior to a bid opening if the grievance is challenging a determination by an Agency that the contract is not subject to this Agreement. For other grievances as to contractor scope of work issues, notice of such challenges shall be submitted to the LMC within 7 calendar days after the act, occurrence or event giving rise to the grievance. If the scope of work grievance is not resolved within 21 days of its submission to the LMC, then the grievance may proceed directly to Step 3 below.

Step 1:

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(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:

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A Step 2 grievance shall be filed with the Agency, the BCTC, the Contractor, and, if the grievance is against a subcontractor, the subcontractor. The Business Manager or designee of the involved Local Union, together with representatives of the involved Contractor, Council, the Construction Manager (or designee), and, if the grievance is against a subcontractor, the subcontractor, shall meet in Step 2 within 7 calendar days of service of the written grievance to arrive at a satisfactory settlement. The BCTC shall schedule the Step 2 meeting.

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 the BCTC. In the event the matter is not resolved at Step 2, either J.J. Pierson or Richard Adelman, who shall act, alternately (beginning with Arbitrator J.J. Pierson), as the Arbitrator under this procedure, shall be designated at the Step 2 hearing and the BCTC will notify the arbitrator of his designation. After such notification by the BCTC, the local demanding arbitration shall within a reasonable time request the arbitrator to schedule the matter for an arbitration hearing date. 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.

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(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, with the exception of those related to compliance with requirements to pay prevailing wages and supplements in accordance with federal or State law, 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.

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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 Program 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 Program 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.

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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. 1. Notwithstanding Section 2 (A) above, and subject to 2 (B)(2) below, Contractors who designate employees pursuant to Article 4, Section 2 (B) and (C) ("core" employees) that are not signatory to a Schedule A Agreement and who maintain bona fide private benefit plans that satisfy the requirements of Section 220 of the Labor Law, may

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satisfy the above benefit obligation with respect to those employees by providing those employees with coverage under their private benefit plans (to the extent consistent with Section 220). The total benefit payments to be made on behalf of each such employee must be equal to the total Section 220 supplement amount and any shortfall must be paid by cash supplement to the employee.

2. A contractor that will satisfy its Section 220 obligations in accordance with subsection 2(B)(1) above shall make available to the Agency at the time of contract award a complete set of plan documents for each non-Schedule A benefit plan into which contributions will be made and/or coverage provided pursuant to the provisions of Section 2(B)(1) above. The Contractor shall also provide certification from a certified public accountant as to the annualized hourly value of such benefits consistent with the requirements of Section 220.

3. The City shall verify that the alternate benefit plan(s), together with any cash supplement to the employee, is compliant with Section 220 prior to awarding the Contractor a contract covered by this Agreement. In the event the Contractor's alternate benefit plan(s), together with any cash supplement to the employee, is determined to be compliant with Section 220 and will be utilized by the Contractor on behalf of Article 4, Section 2(B) and (C) core employees, the Local Unions have no duty to enforce the Contractor's obligations on the alternate benefit plan(s) as they are not party to the alternate plan(s) or privy to the terms and conditions of the plan obligations. In the event the City determines the alternate benefit plan(s), together with any cash supplement to the employee, is not compliant with Section 220, the Contractor may, upon executing a Letter

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of Assent, satisfy its obligations for all employees, including core employees, by contributing to the Schedule A benefit plans in accordance with the terms of the Schedule A Agreements.

C. 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 Program Work done under this Agreement and only for those employees to whom this Agreement requires such benefit payments.

D. 1. 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 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

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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.

2. In addition, where a union or employee benefit fund gives notice to the City that a Contractor is Delinquent as defined in subsection 2(D)(1) above and the City determines that the notice includes appropriate back-up documentation that the Contractor is delinquent, the City will promptly, but not later than twenty (20) days after receipt of the notice, provide a copy of said notice to City Agencies. In the event the City determines there is insufficient back-up documentation, it will notify the appropriate union and/or fringe benefit fund promptly, but not later than twenty (20) days after receipt of the Delinquency Notice, and shall include notice of what additional documentation is requested. Any determination by the City that there is insufficient back-up must be reasonable. This provision is intended to enhance compliance with the prevailing wage

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law and the PLA with respect to the payment of fringe benefits, and is not intended as a substitute for the resolution of a disputed claim pursuant to any applicable law or agreement.

The City and the relevant Agency(s) will thereafter require the Delinquent Contractor to provide cancelled checks or other equivalent proof of payment of benefit contributions that have come due, to be submitted with certified payroll reports for all Program Work covered by this Agreement on which the Delinquent Contractor is engaged, for at least a one-year period or such earlier period if the Contractor is ultimately determined not be a Delinquent Contractor. Such proof of payment when required is a condition of payment of the Delinquent Contractor's invoices by any entity, including, but not limited to, the City, the relevant Agency(s), Construction Manager, General Contractor, the prime or higher level subcontractor, as is appropriate under the Delinquent Contractor's engagement. The union and the funds shall upon request receive copies of the certified payrolls, cancelled checks, or other proof of payment from the City and/or the relevant Agency(s).

E. 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 that the union and/or fringe benefit fund claims to be due it, pending resolution of the dispute pursuant to the union's Schedule A agreement, and the amount shall be paid to the party or parties ultimately determined to be entitled thereto, or held until the

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Delinquent Contractor and union or employee 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.

F. 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.

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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. The standard work week may be reduced to 35 or 37 ½ hours of work at straight time rates, Monday to Friday, 7 or 7 ½ hours per day, plus ½ hour unpaid lunch period in those limited circumstances where the City states in the bid documents that the Contractor will not be given access to the site to accommodate an 8 hour day. The 8 hour, 7 ½ hour or 7 hour work day must be established at the commencement of the project and may not be altered by the Contractor.

B. In accordance with Program 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., for an 8 hour day, and up to 7:30 p.m. for a 10 hour day. 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 Program Work site designated by the Contractor.

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C. Scheduling -- Except as provided above, Monday through Friday is the standard work week; 8 hours of work plus ½ hour unpaid lunch. Notwithstanding any other provision of this Agreement, a contractor may schedule a four day work week, 10 hours per day at straight time rates, plus a ½ hour unpaid lunch, at the commencement of the job.

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 (i) over an employee's regularly scheduled work day, i.e., work over eight (8) hours in a day where 5/8s is scheduled, work over ten (10) hours in a day where 4/10s is scheduled, or work over seven (7) or seven and one half (7 ½) hours where such hours are scheduled pursuant to Article 12, section 1(A) and (ii) over forty (40) hours in a week, or over thirty five (35) or thirty seven and one-half (37 ½) where such hours are scheduled pursuant to Article 12, section 1(A). Overtime shall be paid 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

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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 Program Work schedules and existing Program 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. With respect to second and third shift work there shall be a 5% shift premium. No other premium or other payments for such work shall be required unless such work is in excess of the employee's regularly scheduled work week, i.e., 40 hours in the week or thirty five (35) or thirty seven and one half (37 ½) pursuant to Article 12, section 1(A). All employees within a classification performing Program Work will be paid at the same wage rate regardless of the shift or work scheduled work, subject only to the foregoing provisions.

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C. Flexible Starting Times - Shift starting times will be adjusted by the Contractor as necessary to fulfill Program Work requirements subject to the notice requirements of paragraph A.

SECTION 4. HOLIDAYS

A. Schedule - There shall be nine (9) recognized holidays on the Project:

New Year's Day

Martin Luther King Day President's Day

Memorial Day Veteran's Day

Labor 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 MAKE-UP DAYS

When severe weather, power failure, fire or natural disaster or other similar circumstances beyond the control of the Contractor prevent work from being performed on

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a regularly scheduled weekday, the Contractor may schedule a Saturday make-up day and such time shall be scheduled and paid as if performed on a weekday. Any other Saturday work shall be paid at time and one-half (1½). The Contractor shall notify the Local Union on the missed day or as soon thereafter as practicable if such a make-up day is to be worked.

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. Contractors shall not be permitted to call, text or email or voicemail employees in advance of their regularly scheduled shift starting time to avoid reporting pay. Notwithstanding the above, in the event that the National Weather Service issues a weather advisory for the area in which the work location is situated, and the entire project is shut down as a result of the Weather Advisory, the contractor shall be permitted to speak to employees no less than four (4) hours in advance of their shift starting time, unless the Local Union consents to a shorter notice in writing, to advise them not to report to work due to the National Weather Service advisory, and employees who are so notified shall not receive two (2) hours reporting pay if they report to the work location. The contractor shall make every effort to

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notify each employee directly and confirm that notification has been received. Voice, text, and email messages left for employees without confirmation of delivery and receipt by employee do not constitute sufficient notice under this provision.

B. When an employee, who has completed their scheduled shift and left the Program 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.

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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 Program 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 a full day's pay in accordance with the employee's regularly scheduled work day under Article 12, section (1)(A). Further, the employee shall be rehired at such time as able to return to duties provided there is still Program 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

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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. Where 4/10s are being worked there shall be a morning and an afternoon coffee break.

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.

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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 Program 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 Program Work. Such rules will be published and posted in conspicuous places throughout the Program 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 Program 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.

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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 determination of the Agency or Construction Manager, and when used shall be staffed and assigned to the appropriate trade(s) with jurisdiction. Temporary services 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 services requirements during non-working hours, and when used shall be staffed and assigned to the appropriate trades(s). There shall be no stacking of trades on temporary services, provided this does not constitute a waiver of primary trade jurisdiction. In the event a temporary system component 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.

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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 Program 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 Program 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.

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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,

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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 Program funding or any New York State Labor Law exemption for all or any part of the Program Work, the provision or provisions involved (and/or its application to particular Program 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

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basis, or is otherwise determined to be in violation of law, or may cause the loss of Program funding or any New York State Labor Law exemption for all or any part of the Program Work, such requirement (and/or its application to particular Program 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 any⁴ 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 Program 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.

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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 that are the basis for the Schedule A notify the Agency and Construction Manager in writing of the 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 Program 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 Program Work by any Local Union involved in the renegotiation of Area

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Local Collective Bargaining Agreements nor shall there be any lock-out on such Program 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 New York City 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 Program to create and maintain an integrated database of veterans interested in working on this Project and of

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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.

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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:
Anthony Shorris
First Deputy Mayor

APPROVED AS TO FORM:

ACTING CORPORATION COUNSEL
NEW YORK CITY

LIST OF SIGNATORY UNIONS

Boiler Makers Local No. 5
Carpenters District Council
Cement Masons No. 780
Concrete Workers, District Council No. 16
Derrickmen and Riggers, Local Union No. 197
Drywall Tapers 1974, District Council 9
Electrical Workers Local No. 3
Glaziers Local Union No. 1087 District Council 9
Heat & Frost Insulators, Local Union No. 12A
Heat & Frost Insulators, Local Union No. 12
Iron Workers District Council
Iron Workers Local Union No. 40
Iron Workers Local No. 361
Laborers Local No. 78, Asbestos & Lead Abatement
Laborers Local 1010 Pavers and Road Builders District Council
Laborers 79 Construction and General Building Laborers
Laborers Local No. 731 Excavators
Mason Tenders District Council
Metal Lathers Local No. 46
Metal Polishers District Council 9
Ornamental Iron Workers Local No. 580
Painters District Council 9
Plumbers Local No. 1
Painters, Decorators & Wallcoverers District Council 9
Painters Structural Steel No. 806
Plasterers Local Union No. 262
Roofers & Waterproofers Local 8
Steamfitters Local Union No. 638
Sheet Metal Workers Local No. 28
Sheet Metal Workers Local No. 137
Teamsters Local Union No. 282
Teamsters Local Union 814
Teamsters Local No. 813 Private Sanitation
Tile, Marble & Terrazzo B.A.C. Local Union No. 7

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SCHEDULE "A"

Union	Collective Agreement w/
Architectural and Ornamental Iron Workers Local Union 580, AFL-CIO	Allied Building Metal Industries, Inc.
Building, Concrete, Excavating & Common Laborers Local 731	Independent
Building, Concrete, Excavating & Common Laborers Local 731	Members of the General Contractors Association of New York, Inc.
District Council No. 9, I.U.P.A.T Glaziers Local 1087	Window and Plate Glass Dealers Association
Drywall Tapers and Pointers Local 1974, affiliated with International Union of Painters & Allied Trades and Drywall Taping Contractors Association & Association of Wall-Ceiling & Carpentry Industries NY, Inc.	Independent
Enterprise Association of Steamfitters and Apprentices Local 638	Mechanical Contractors Association of NY, Inc.
Enterprise Association of Steamfitters and Apprentices Local 638	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	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	Member of the General Contractors Association of New York, Inc.
International Association of Heat and Frost Insulators and Allied Workers Local No. 12 of New York City	Independent
International Association of Heat and Frost Insulators and Allied Workers Local No. 12 of New York City	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	Independent

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International Association of Heat and Frost Insulators and Allied Workers Local No. 12A of New York City	Environmental Contractors Association, Inc.
International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers, AFL-CIO, Local Lodge No. 5	Boilermakers Association of Greater New York
Local Union No. 3 International Brotherhood of Electrical Workers, AFL-CIO	New York Electrical Contractors Association
International Brotherhood of Teamsters, Local 282, High Rise contract	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	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	Independent
Local 8 Roofers, Waterproofers & Allied Workers	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	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	Independent
Operative Plasterers and Cement Masons' International Association Local No. 262	Independent
Painters and Allied Trades AFL-CIO, District Council No. 9 (Painting and Protective Coatings CBA)	Independent

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Painters and Allied Trades AFL-CIO, District Council No. 9 (Painting and Protective Coatings CBA)	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	Sheet Metal & Air Conditioning Contractors Association of New York City, Inc.
Sheet Metal Workers' International Association, Local 137	The Greater New York Sign Association
Structural Steel and Bridge Painters Local 806, DC 9 International Union of Painters and Allied Trades AFL-CIO	New York Structural Steel Painting Contractors Association
Teamsters Local 813	Independent
Teamsters Local 813	IESI NY Corporation
Teamsters Local 814	Greater New York Movers and Warehousemen's Bargaining Group
The Cement Masons' Union, Local 780	Cement League
The District Council of Cement and Concrete Workers (comprised of Local 6A, Local 18A and Local 20)	Cement League
The District Council of Cement and Concrete Workers (comprised of Local 6A, Local 18A and Local 20)	Independent

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The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Heavy Carpenters	GCA
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Dockbuilders Local No. 1556	Concrete Contractors of NY
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Dockbuilders Local 1556	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Millwright Local 740	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Timbermen Local 1556	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Timbermen Local 1556	GCA
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Heavy Carpenters	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	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	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	The Test Boring Association

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The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	Building Contractors Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	The Association of Wall-Ceiling & Carpentry Industries of New York, Incorporated
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners	The Cement League
The District Council of NYC and Vicinity of the United Brotherhood of Carpenters and Joiners of America	New York City Millwright Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners	Greater New York Floor Covering Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	Association of Architectural Metal & Glass
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	Concrete Contractors of NY
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Building Construction Carpenters	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Local 2287	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Shop Carpenters	Independent
The Tile Setters and Tile Finishers Union of New York and New Jersey, Local 7 of the International Bricklayers and Allied Craftworkers	The Greater New York and New Jersey Contractors Association

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United Derrickmen & Riggers Association, Local 197 of NY, LI, Westchester & Vicinity	Contracting Stonesetters Association Inc.
United Derrickmen & Riggers Association L 197 of NY, LI, Westchester and Vicinity	Building Stone and Pre-cast Contractors Association
International Union of Operating Engineers Local 14-14B	Building Contractors Association
International Union of Operating Engineers Local 14-14B	Contractors Association of Greater NY
International Union of Operating Engineers Local 14-14B	GCA
International Union of Operating Engineers Local 14-14B	The Cement League
International Union of Operating Engineers Local 14-14B	Allied Building Metal Industries, Inc.
International Union of Operating Engineers Local 14-14B	Brick Association
International Union of Operating Engineers Local 14-14B	Independent
International Union of Operating Engineers Local 15	Allied Building Metal Industries, Inc.
International Union of Operating Engineers Local 15-15A	General Contractors Association
International Union of Operating Engineers Local 15D	General Contractors Association
International Union of Operating Engineers Local 15D	Structural Steel Erectors

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International Union of Operating Engineers Local 15-15A	Building Contractors Association
International Union of Operating Engineers Local 15D	Building Contractors Association
International Union of Operating Engineers Local 15-15A	Contractors Association of Greater NY
International Union of Operating Engineers Local 15D	Contractors Association of Greater NY
International Union of Operating Engineers Local 15-15A	The Cement League
International Union of Operating Engineers Local 15D	The Cement League

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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; local trust agreements for employee benefit funds; and trust documents for joint apprentice programs as well as apprentice program rules and procedures 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.

Provide description of the Work, identify craft jurisdiction(s) and all contract numbers below:

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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 _____,

Notary Public

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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 Standard of Excellence.

NOTICE TO BIDDERS

Please be advised that the City of New York has issued a new Standard Construction Contract. The new Contract, which is incorporated in this bid, is significantly different from the 2008 version previously used by the City. A listing of some of the significant changes is provided below. This notice is only a partial listing. Please refer to the Contract itself for a full understanding of the changes and the actual text of the changes that were made. 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.

Significant changes include the following:

ARTICLE 11 DAMAGES CAUSED BY DELAYS

In 2008, the City embarked on a pilot project to test the use of new construction contract language altering the allocation of the risk of project delays, as between the City and the contractor. The City has determined to make the pilot project language the standard language for all City construction contracts. Accordingly, there is now one Standard City Construction Contract that is to be used by all agencies for all bids released after the release of the new contract. The damages for delay language is Article 11. Please note that changes have been made to the damages for delay provisions from the pilot to the adopted version.

ARTICLE 22 INSURANCE

Changes have been made to the insurance provisions, including incorporating requirements that the insurance provided comply with recent NYC Department of Buildings regulations specifying required dollar limits for CGL insurance for certain projects and requiring proof of builder's risk insurance prior to Work commencing rather than within 10 days of award.

ARTICLE 26 EXTRA WORK

The percentage paid for overhead for Extra Work pursuant to Section 26.1.11 is increased from 10% to 12% and the calculation of Worker's Compensation insurance costs reimbursed for Extra Work has been clarified.

ARTICLE 37 LABOR LAW REQUIREMENTS
ARTICLE 38 PAYROLL REPORTS

The provisions governing Labor Law provisions have been tightened, including requirements the employee identification cards include a photo (unless the requirement is waived), a prohibition on cash payments to employees and subcontractors, and clear enforcement authority requirements.

ARTICLE 70 ELECTRONIC FILING

A provision is added to make mandatory the electronic filing of certain alteration permits with the Department of Buildings.

Other significant changes include the following:

ARTICLE 7 INDEMNIFICATION

Changes have been made to the indemnification provisions.

ARTICLE 14 FINAL ACCEPTANCE OF WORK
ARTICLE 44 SUBSTANTIAL COMPLETION PAYMENT

The Commissioner is no longer required to issue a substantial completion determination in addition to the already existing requirement that the Engineer issue a substantial completion determination and reach an agreement on a punch list of remaining work. Now, the Engineer, when issuing the punch list to the Contractor, must also include a proposed schedule for the completion of the punch list. The Contractor may propose an alternative schedule that is subject to the approval of the Engineer. If the Contractor fails to respond to the Engineer's proposed schedule, the Engineer's schedule is deemed accepted.

ARTICLE 15 LIQUIDATED DAMAGES

The contract is revised to match Schedule A to provide that liquidated damages are available only until substantial completion.

ARTICLE 17 SUBCONTRACTS

The requirements for prior approval of subcontractors, and for contractors to be responsible for the actions of their subcontractors, have been tightened. The requirement that the Contractor list subcontractors in the City's Payee Information Portal has been added; the provision was previously attached as a rider.

ARTICLE 19 SECURITY DEPOSIT

The provisions governing the return of bid deposits are clarified.

ARTICLE 20 PAYMENT GUARANTEE

The Payment Guaranty provisions, which apply when the City does not require the Contractor to obtain payment bonds, has been significantly revised to track the requirements of State Finance law 137.

ARTICLE 28 RECORDKEEPING FOR EXTRA OR DISPUTED WORK

The recordkeeping requirement that currently apply to payments for Time & Materials for extra work are expressly made applicable to regular work that is paid for on a T & M basis.

ARTICLE 35 EMPLOYEES

The whistleblower provisions of local law are added to the construction contract. They previously have been attached as a rider.

ARTICLE 38 PAYROLL REPORTS
ARTICLE 77 RECORDS RETENTION

Requirements that records be maintained for six years and directions on how such records must be made available.

ARTICLE 42 PARTIAL PAYMENTS

Increased flexibility has been provided for when contractors may submit invoices.

ARTICLE 62 TAX EXEMPTION

The provisions identifying the State tax exemption for municipalities are revised to more clearly describe State law.

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**NEW YORK CITY STANDARD CONSTRUCTION CONTRACT (DEC. 2013)
INSURANCE RIDER**

The following provisions supersede the corresponding provisions in the December 2013 version of the New York City Standard Construction Contract:

1. Section 22.1.1(c) provides as follows:

22.1.1(c) If the **Work** requires a permit from the Department of Buildings pursuant to 1 RCNY Section 101-08, the **Contractor** shall provide Commercial General Liability Insurance with limits of at least those required by 1 RCNY section 101-08 or greater limits provided by the Agency in Schedule A. If the Work does not require such a permit, the minimum limits shall be those provided for in Schedule A.

2. Section 22.3.3 provides as follows:

22.3.3 For policies provided pursuant to all of Article 22.1 other than Article 22.1.2, the **Contractor** shall submit one or more Certificates of Insurance on forms acceptable to the **Commissioner**. All such Certificates of Insurance shall certify (a) the issuance and effectiveness of such policies of insurance, each with the specified minimum limits (b) for insurance secured pursuant to Article 22.1.1 that the City and any other entity specified in Schedule A is an Additional Insured thereunder; (c) in the event insurance is required pursuant to Article 22.1.6 and/or Article 22.1.7, that the City is an Additional Insured thereunder; and (d) the company code issued to the insurance company by the National Association of Insurance Commissioners (the NAIC number). All such Certificates of Insurance shall be accompanied by the required additional insured endorsements and either a duly executed "Certification by Insurance Broker or Agent" in the form contained in Part III of Schedule A or copies of all policies referenced in such Certificate of Insurance as certified by an authorized representative of the issuing insurance carrier. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

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PAID SICK LEAVE LAW CONTRACT RIDER

Introduction and General Provisions

The Earned Sick Time Act, also known as the Paid Sick Leave Law ("PSLL"), requires covered employees who annually perform more than 80 hours of work in New York City to be provided with paid sick time.¹ Contractors of the City of New York or of other governmental entities may be required to provide sick time pursuant to the PSLL.

The PSLL became effective on April 1, 2014, and is codified at Title 20, Chapter 8, of the New York City Administrative Code. It is administered by the City's Department of Consumer Affairs ("DCA"); DCA's rules promulgated under the PSLL are codified at Chapter 7 of Title 6 of the Rules of the City of New York ("Rules").

Contractor agrees to comply in all respects with the PSLL and the Rules, and as amended, if applicable, in the performance of this agreement. Contractor further acknowledges that such compliance is a material term of this agreement and that failure to comply with the PSLL in performance of this agreement may result in its termination.

Contractor must notify the Agency Chief Contracting Officer of the City agency or other entity with whom it is contracting in writing within ten (10) days of receipt of a complaint (whether oral or written) regarding the PSLL involving the performance of this agreement. Additionally, Contractor must cooperate with DCA's education efforts and must comply with DCA's subpoenas and other document demands as set forth in the PSLL and Rules.

The PSLL is summarized below for the convenience of Contractor. Contractor is advised to review the PSLL and Rules in their entirety. On the website www.nyc.gov/PaidSickLeave there are links to the PSLL and the associated Rules as well as additional resources for employers, such as Frequently Asked Questions, timekeeping tools and model forms, and an event calendar of upcoming presentations and webinars at which Contractor can get more information about how to comply with the PSLL. Contractor acknowledges that it is responsible for compliance with the PSLL notwithstanding any inconsistent language contained herein.

Pursuant to the PSLL and the Rules:

Applicability, Accrual, and Use

An employee who works within the City of New York for more than eighty hours in any consecutive 12-month period designated by the employer as its "calendar year" pursuant to the PSLL ("Year") must be provided sick time. Employers must provide a minimum of one hour of sick time for every 30 hours worked by an employee and compensation for such sick time must

¹ Pursuant to the PSLL, if fewer than five employees work for the same employer, as determined pursuant to New York City Administrative Code §20-912(g), such employer has the option of providing such employees uncompensated sick time.

be provided at the greater of the employee's regular hourly rate or the minimum wage. Employers are not required to provide more than forty hours of sick time to an employee in any Year.

An employee has the right to determine how much sick time he or she will use, provided that employers may set a reasonable minimum increment for the use of sick time not to exceed four hours per day. In addition, an employee may carry over up to forty hours of unused sick time to the following Year, provided that no employer is required to allow the use of more than forty hours of sick time in a Year or carry over unused paid sick time if the employee is paid for such unused sick time and the employer provides the employee with at least the legally required amount of paid sick time for such employee for the immediately subsequent Year on the first day of such Year.

An employee entitled to sick time pursuant to the PSLL may use sick time for any of the following:

- such employee's mental illness, physical illness, injury, or health condition or the care of such illness, injury, or condition or such employee's need for medical diagnosis or preventive medical care;
- such employee's care of a family member (an employee's child, spouse, domestic partner, parent, sibling, grandchild or grandparent, or the child or parent of an employee's spouse or domestic partner) who has a mental illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;
- closure of such employee's place of business by order of a public official due to a public health emergency; or
- such employee's need to care for a child whose school or childcare provider has been closed due to a public health emergency.

An employer must not require an employee, as a condition of taking sick time, to search for a replacement. However, an employer may require an employee to provide: reasonable notice of the need to use sick time; reasonable documentation that the use of sick time was needed for a reason above if for an absence of more than three consecutive work days; and/or written confirmation that an employee used sick time pursuant to the PSLL. However, an employer may not require documentation specifying the nature of a medical condition or otherwise require disclosure of the details of a medical condition as a condition of providing sick time and health information obtained solely due to an employee's use of sick time pursuant to the PSLL must be treated by the employer as confidential.

If an employer chooses to impose any permissible discretionary requirement as a condition of using sick time, it must provide to all employees a written policy containing those requirements, using a delivery method that reasonably ensures that employees receive the policy. If such employer has not provided its written policy, it may not deny sick time to an employee because of non-compliance with such a policy.

Sick time to which an employee is entitled must be paid no later than the payday for the next regular payroll period beginning after the sick time was used.

Exemptions and Exceptions

Notwithstanding the above, the PSLL does not apply to any of the following:

- an independent contractor who does not meet the definition of employee under section 190(2) of the New York State Labor Law;
- an employee covered by a valid collective bargaining agreement in effect on April 1, 2014 until the termination of such agreement;
- an employee in the construction or grocery industry covered by a valid collective bargaining agreement if the provisions of the PSLL are expressly waived in such collective bargaining agreement;
- an employee covered by another valid collective bargaining agreement if such provisions are expressly waived in such agreement and such agreement provides a benefit comparable to that provided by the PSLL for such employee;
- an audiologist, occupational therapist, physical therapist, or speech language pathologist who is licensed by the New York State Department of Education and who calls in for work assignments at will, determines his or her own schedule, has the ability to reject or accept any assignment referred to him or her, and is paid an average hourly wage that is at least four times the federal minimum wage;
- an employee in a work study program under Section 2753 of Chapter 42 of the United States Code;
- an employee whose work is compensated by a qualified scholarship program as that term is defined in the Internal Revenue Code, Section 117 of Chapter 20 of the United States Code; or
- a participant in a Work Experience Program (WEP) under section 336-c of the New York State Social Services Law.

Retaliation Prohibited

An employer may not threaten or engage in retaliation against an employee for exercising or attempting in good faith to exercise any right provided by the PSLL. In addition, an employer may not interfere with any investigation, proceeding, or hearing pursuant to the PSLL.

Notice of Rights

An employer must provide its employees with written notice of their rights pursuant to the PSLL. Such notice must be in English and the primary language spoken by an employee, provided that DCA has made available a translation into such language. Downloadable notices are available on DCA's website at <http://www.nyc.gov/html/dca/html/law/PaidSickLeave.shtml>.

Any person or entity that willfully violates these notice requirements is subject to a civil penalty in an amount not to exceed fifty dollars for each employee who was not given appropriate notice.

Records

An employer must retain records documenting its compliance with the PSSL for a period of at least three years, and must allow DCA to access such records in furtherance of an investigation related to an alleged violation of the PSSL.

Enforcement and Penalties

Upon receiving a complaint alleging a violation of the PSSL, DCA has the right to investigate such complaint and attempt to resolve it through mediation. Within 30 days of written notification of a complaint by DCA, or sooner in certain circumstances, the employer must provide DCA with a written response and such other information as DCA may request. If DCA believes that a violation of the PSSL has occurred, it has the right to issue a notice of violation to the employer.

DCA has the power to grant an employee or former employee all appropriate relief as set forth in New York City Administrative Code 20-924(d). Such relief may include, among other remedies, treble damages for the wages that should have been paid, damages for unlawful retaliation, and damages and reinstatement for unlawful discharge. In addition, DCA may impose on an employer found to have violated the PSSL civil penalties not to exceed \$500 for a first violation, \$750 for a second violation within two years of the first violation, and \$1,000 for each succeeding violation within two years of the previous violation.

More Generous Policies and Other Legal Requirements

Nothing in the PSSL is intended to discourage, prohibit, diminish, or impair the adoption or retention of a more generous sick time policy, or the obligation of an employer to comply with any contract, collective bargaining agreement, employment benefit plan or other agreement providing more generous sick time. The PSSL provides minimum requirements pertaining to sick time and does not preempt, limit or otherwise affect the applicability of any other law, regulation, rule, requirement, policy or standard that provides for greater accrual or use by employees of sick leave or time, whether paid or unpaid, or that extends other protections to employees. The PSSL may not be construed as creating or imposing any requirement in conflict with any federal or state law, rule or regulation.

HIRING AND EMPLOYMENT RIDER:
HIRENYC AND REPORTING REQUIREMENTS

Introduction

This Rider shall apply to all contracts for goods, services, and construction with a value of one million dollars (\$1,000,000.00) or more, provided, however, that certain requirements of the Rider shall only apply as indicated below. This Rider addresses the HireNYC process, including reporting obligations under the HireNYC process, and certain other reporting requirements imposed by law. In general, the HireNYC process under this Rider requires the Contractor to enroll with the HireNYC portal for the City of New York ("the City") found within the Department of Small Business Services's ("SBS") website, to disclose all entry to mid-level job opportunities described in this Rider arising from this contract and located in New York City, and to agree to interview qualified candidates from HireNYC for those opportunities.

HireNYC Requirements

A. Enrollment

The Contractor shall enroll with the HireNYC system, found at www.nyc.gov/sbs, within thirty (30) days after the registration of this Contract pursuant to Section 328 of the New York City Charter. The Contractor shall provide information about the business, designate a primary contact and say whether it intends to hire for any entry to mid-level job opportunities arising from this contract and located in New York City, and, if so, the approximate start date of the first hire.

B. Job Posting Requirements

Once enrolled in HireNYC, the Contractor agrees to update the HireNYC portal with all entry to mid-level job opportunities arising from this contract and located in New York City, if any, which shall be defined as jobs requiring no more than an associate degree, as provided by the New York State Department of Labor (see Column F of <https://labor.ny.gov/stats/2012-2022-NYS-Employment-Prospects.xls>). The information to be updated includes the types of entry and mid-level positions made available from the work arising from the contract and located in New York City, the number of positions, the anticipated schedule of initiating the hiring process for these positions, and the contact information for the Contractor's representative charged with overseeing hiring. The Contractor must update the HireNYC portal with any hiring needs arising from the contract and located in New York City, and the requirements of the jobs to be filled, no less than three weeks prior to the intended first day of employment for each new position, except with the permission of SBS, not to be unreasonably withheld, and must also update the HireNYC portal as set forth below.

After enrollment through HireNYC and submission of relevant information, SBS will work with the Contractor to develop a recruitment plan which will outline the candidate screening process,

and will provide clear instructions as to when, where, and how interviews will take place. HireNYC will screen applicants based on employer requirements and refer applicants whom it believes are qualified to the Contractor for interviews. The Contractor must interview referred applicants whom it believes are qualified.

After completing an interview of a candidate referred by HireNYC, the Contractor must provide feedback via the portal within twenty (20) business days to indicate which candidates were interviewed and hired, if any. In addition, the Contractor shall provide the start date of new hires, and additional information reasonably related to such hires, within twenty (20) business days after the start date. In the event the Contractor does not have any job openings covered by this Rider in any given year, the Contractor shall be required to provide an annual update to HireNYC to that effect. For this purpose, the reporting year shall run from the date of the registration of the contract and each anniversary date.

These requirements do not limit the Contractor's ability to assess the qualifications of prospective workers, and to make final hiring and retention decisions. No provision of this Rider shall be interpreted so as to require the Contractor to employ any particular worker.

In addition, the provisions of this Rider shall not apply to positions that the Contractor intends to fill with employees employed pursuant to the job retention provision of Section 22-505 of the Administrative Code of the City of New York. The Contractor shall not be required to report such openings with HireNYC. However, the Contractor shall enroll with the HireNYC system pursuant to Section A, above, and, if such positions subsequently become open, then the remaining provisions of this Rider will apply.

C. Breach and Liquidated Damages

If the Contractor fails to comply with the terms of the contract and this Rider (1) by not enrolling its business with HireNYC; (2) by not informing HireNYC, as required, of open positions; or (3) by failing to interview a qualified candidate, the contracting agency may assess liquidated damages in the amount of two-thousand five hundred dollars (\$2,500.00) per breach. For all other events of noncompliance with the terms of this Rider, the agency may assess liquidated damages in the amount of five hundred dollars (\$500) per breach.

Furthermore, in the event the Contractor breaches the requirements of this Rider during the term of the contract, the City may hold the Contractor in default of this contract.

Audit Compliance

In addition to the auditing requirements set forth in other parts of the contract, the Contractor shall permit SBS and the City to inspect any and all records concerning or relating to job openings or the hiring of individuals for work arising from the contract and located in New York City. The Contractor shall permit an inspection within seven (7) business days of the request.

Other Reporting Requirements

The Contractor shall report to the City, on a monthly basis, all information reasonably requested by the City that is necessary for the City to comply with any reporting requirements imposed by law or rule, including any requirement that the City maintain a publicly accessible database. In addition, the Contractor agrees to comply with all reporting requirements imposed by law or rule, or as otherwise requested by the City.

Construction Requirements

Construction contractors shall comply with the HireNYC requirements set forth above for all non-trades jobs (e.g., for an administrative position arising out of the work of the contract and located in New York City) as set forth above.

In addition, construction contractors shall reasonably cooperate with SBS and the City on specific outreach events, including Hire on the Spot events, for the hiring of trades workers for the work of this contract.

Further, this contract shall be subject to a project labor agreement if so required elsewhere in this contract.

Federal Hiring Requirements

The Contractor shall comply with all federal hiring requirements as may be set forth elsewhere in this contract, including, as applicable:

- Section 3 of the HUD Act of 1968, which requires, to the greatest extent feasible, economic opportunities for 30 percent of new hires be given to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- Executive Order 11246, which prohibits discrimination in employment due to race, color, religion, sex or national origin, and requires the implementation of goals for minority and female participation for work involving any Construction trade.

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

INFORMATION FOR BIDDERS

December 2013

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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

June 2015

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); 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 16 NYCRR Part 753
- ❑ Title 15 of the Rules of the City of New York, Chapter 13 Citywide Construction Dust Mitigation
- ❑ Manual on Uniform Traffic Control Devices (MUTCD)
- ❑ Title 15 of the Rules of the City of New York, Chapter 28 Citywide Construction Noise Mitigation

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 QA&CS 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 QA&CS within the Division of Program Management/ Safety & Site 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").

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Daily Safety Job Briefing: Daily jobsite safety meetings, giving to all jobsite personnel by contractor, with the purpose of discussing project specific safety procedures for the scheduled construction work.

Director - Quality Assurance and Construction Safety (QA&CS): Responsible for the operations of the QACS Construction Safety Unit and the DDC Site Safety management programs.

Job Hazard Analysis (JHA): A process of identifying the major job steps and any potential site-specific hazards that may be present during construction and establishing the means and methods to eliminate or control those hazards.

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.

Project Site: Those areas indicated in the Contract Documents where the Work is to be performed.

Project Safety Representative: The designated project safety representative shall have completed an authorized 30 hour OSHA Construction Safety Course and other safety training applicable to Contractor's/subcontractor's project work. Except in instances where a dedicated Project Safety Manager is required, a Project Safety Representative may also function as a superintendent, foreman or crew leader on the Project, but must have sufficient experience and authority to undertake corrective actions and must qualify to be a competent person. No work is to be performed on site when a Project Safety Representative is not present.

Project Safety Manager: A dedicated, full-time project safety manager may be a contractual requirement on large projects or projects deemed by DDC to be particularly high risk. This would be in addition or in lieu of a Contractor's Project Safety Representative. This individual shall not have any other assigned duties. This individual shall have received, at a minimum an authorized 30 hour OSHA Construction Safety Course. Other examples of acceptable training are OSHA Safety and Health Standards for the Construction Industry training program (OSHA 510), Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH) or a degree/certificate in a safety and health from a college-level curriculum.

A Project Safety Manager shall possess the additional training, years of experience, and skills necessary to thoroughly understand the health and safety hazards and controls for large construction projects, including the full scope of the specific Work.

QA&CS - Quality Assurance and Construction Safety of the New York City Department of Design and Construction.

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 Construction Management firm, 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 Manager: For certain projects, as defined in NYC Construction Codes - Title 28, the Contractor shall provide a Site Safety Manager with a Site Safety Manager License issued by the NYC Department of Building.

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 procedures 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.

Work: The construction required by the Contract Documents whether completed or partially completed, performed by the Contractor/ subcontractors. Work refers to the furnishing of labor, furnishing and incorporating materials and equipment into the construction and providing any service required by the Contract Documents to fulfill the Contractor's obligation to complete the Project.

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. DDC or CM Resident Engineer / Construction Project 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 meetings and daily safety job briefings.
- 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 and Accident Notification and Response Protocol.
- Gathers facts related to all accidents and prepares DDC Construction Accident Report.
- Notifies the Construction Safety Unit within two (2) hours of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB or others and forwards a copy of the inspection report within three days of its receipt.
- Monitors the conditions at the site for conformance with the contractor's 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 contractor's 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 unsafe or unhealthy condition and directs the contractor to provide such labor, materials, equipment and supervision to abate such conditions.
- Escort and assist QA&CS Construction Safety Auditors during the field and record inspections.
- Reports emergency conditions to the Construction Safety Unit immediately.

B. Contractors

- Submit a completed Safety Questionnaire and other safety performance related documentation with its bid or as part of a pre-qualification package.
- Complete a written Job Hazard Analysis (JHA) that identifies safety hazards for project specific work tasks and hazard control methods. A written JHA shall be available at the site for reference and included in the Site Safety Plan submitted by the contractor.
- Submit a Site Safety Plan and Safety Program within 30 days from the Award Date 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.

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- Develop project specific safety procedures to protect general public during all construction activities for the duration of the project.
- Ensure that all employees are aware of the hazards associated with the project through documented formal and informal training and/or other communications. Conduct and document weekly safety meetings and daily job briefing sessions for the duration of the project. Documentation to be provided to the RE/CPM on a monthly basis.
- Name the Project Safety Representative and Project Safety Manager, if required. The Contractor will be required to identify the Project Safety Representative and Project Safety Manager in the Site Safety Plan. Resumes, outlining the qualification and experience for the Project Safety Representative and Project Safety Manager, shall be available upon request. DDC reserves the right to request that the Contractor replace any Project Safety Representative or Project Safety Manager for any reason at any time during the project.
- Name a Competent Person(s), The Contractor will be required to identify a Competent Person(s) 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.
- Conduct applicable safety training prior to the commencement of work at the site. All training records (OSHA 10-hour, flagger, scaffold, fall protection, confined space entry, etc.) shall be provided to the RE/CPM prior to mobilization, included in the Site Safety Plan, kept current during the course of the project, and available for review. Prior to performing any work on DDC project all employees shall have successfully completed, within the previous five calendar years, a 10 Hour OSHA construction safety course.
- As part of the Site Safety Plan, prepare a site specific programs and plans, such as MPT plan, steel erection plan, confined space program, fall protection plan, demolition plan, etc. (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 Project Safety Representative and/or Project Safety Manager will conduct this training prior to mobilization and provide documentation to the RE/CPM.
- 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 or unhealthy conditions to the RE/CPM as soon as practical, but no more than 24 hours after discovery, and take prompt actions to remove or abate such conditions.
- Report any accidents involving injuries to workers or the general public, as well as property damage, to the RE/CPM within one (1) hour.
- Following an accident, the Contractor shall not remove or alter any equipment, structure, material, or evidence related to the accident. Exception: Immediate emergency procedures taken to secure structures, temporary construction, operations, or equipment that pose a continued imminent danger or facilitate assistance for persons who are trapped or who have sustained bodily injury.
- Notify the RE/CPM within one (1) hour of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB or others.
- Maintain all records pertaining to all required compliance documents and accident and injury reports.
- Address 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 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 company workers' compensation experience modification rating and OSHA Incident 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 information within 15 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:

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- 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 (3) years; and
- Criteria 4: A fatality (worker or member of public) and injuries, requiring OSHA notification, experienced on or near Contractor's worksite within the last three (3) years; and
- Criteria 5: Past safety performance on DDC projects (accidents; status of safety program and site safety plan submittals; etc.)
- Criteria 6: OSHA violation history for the last three (3) years;
- Criteria 7: Contractor shall provide OSHA Injury and Illness Records (currently OSHA 300 and 300A Logs) 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 details concerning the Contractor's safety experience. DDC may request the Contractor to provide copies of, among other things, accident investigation reports, OSHA records, OSHA and NYC DOB citations, EPA citations and written corrective action plan.

VI. SAFETY PROGRAM AND SITE SAFETY PLAN

Within thirty (30) days from the Award Date, 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 standards. The Site Safety Plan shall identify project work scope, safety hazards associated with the project tasks, and include specific safety procedures 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.

Safety Program: Corporate Safety Program established by the Contractor that includes the Contractor's overall safety policy, regulatory compliance plan and basic safety procedures covering all aspects of construction operations, performed by the Contractor. The Safety Program shall be a written document with a separate section describing each element of the Safety Program. The Safety Program shall have at minimum the following elements applicable to the Contractor's operations:

- Responsibility and Organization – Contractor's company organization chart, including titles, names, contact information, roles and responsibilities for key personnel, etc.
- Safety Training Program – Contractor's corporate training program.
- Hazard Corrective Actions – Criteria for safety inspections, identification of safety non-compliances, implementation and verification of corrective actions, forms to document safety inspections results, etc.
- Accident/Exposure Investigation
- Recordkeeping and Reporting Injuries – Responsible staff; reporting and recording criteria; OSHA 300 and 300A form completion, etc.
- Fire Protection and Prevention Program
- Housekeeping
- Illumination
- Sanitation
- Personal Protective Equipment (PPE) – Company policy for the use of head protection, foot protection, hearing protection, eye and face protection, protective clothing, and any additional protective equipment based on work tasks; PPE inspection and replacement policy.
- Hazard Communication Program
- Employee Emergency Action Plan
- Protection of Underground Facilities and Utilities
- Ionizing/Nonionizing Radiation
- Material Handling, Storage, Use and Disposal
- Tools – Hand and Power
- Signs, Signals, and Barricades

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- Scaffold – Local Law 52 requirements, installation, use, inspection, dismantling, training and general safety requirements.
- Welding and Cutting
- Electrical Safety
- Fall Protection
- Cranes, Derrick, Hoists, Elevators, Conveyors
- Excavation Safety
- Concrete and Masonry Construction
- Maintenance and Protection of Traffic
- Steel Erection
- Demolition
- Blasting and the Use of Explosives
- Stairways and Ladders
- Toxic and Hazardous Substances
- Alcohol and Drug Abuse Policy
- Rodents and Vermin
- Occupational Noise Exposure
- Confined Space Program – General confined Space Program: training requirements, confined space hazard evaluation procedure, atmospheric testing procedure, confined space classification, permit-required procedure, communication procedure, rescue procedure, forms, etc.
- Construction Vehicles/Heavy Equipment
- Dust Control Procedures

Site Safety Plan: The Site Safety Plan shall be a written document and shall apply to all project specific Contractor and subcontractor operations, and shall have at a minimum, the following elements with each element described in a separate section (It may be necessary to modify the basic format for certain unique or high-risk projects, such as tunnels or high-rise construction):

- Project Work Scope – Detailed information regarding work tasks that will be performed by contractor and subcontractors under the project.
- Responsibility and Organization – Contractor's organization chart with responsible staff for the project, including titles, names, contact information, roles and responsibilities.
- Safety Training and Education – OSHA 10 Hours training, requirements for daily safety briefings and weekly safety meetings, any work task specific training, responsible staff for implementation of training program for the project.
- Job Hazard Analysis (JHA) – Project specific Job Hazard Analysis including work tasks, identified hazards, hazard control methods (administrative, engineering, PPE), contractor's name, project id, location, name and signature of a certifying person, hazard assessment date.
- Protection of Public
- Hazard Corrective Actions – Responsible staff, forms, frequency of safety inspections and implementation of corrective actions.
- Accident/Exposure Investigation – Accident/incident notification procedure of DDC project staff. Project specific procedures for accident investigation and implementation of corrective actions.
- First Aid and Medical Attention – Responsible staff, location and inspection of First Aid kit, directions to local hospitals; emergency telephone numbers.
- Project Specific Fire Protection and Prevention Program.
- Project Specific Illumination Procedure.
- Project Specific Sanitation Procedure.
- Personal Protective Equipment (PPE)
- Hazard Communication Program – Responsible staff; training; SDS records, project specific list of chemical; location of the program and SDS records.
- Means of Egress – Information regarding free and unobstructed egress from all parts of the building or structure; exit marking; maintenance of means of egress, etc.
- Employee Emergency Action Plan – Project specific: responsible staff, emergency alarm system, evacuation procedure, procedure to account for employees after evacuation, etc.
- Evacuation Plan – Project specific evacuation plan (drawing/scheme) with exists and evacuation routes.

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- Protection of Underground Facilities and Utilities, including responsible staff.
- Ionizing/Nonionizing Radiation – Competent person, license and qualification requirements, type of radiation, employees exposure and protection, etc.
- Material Handling, Storage, Use and Disposal – Project specific information regarding material storage and disposal.
- Signs, Signals, and Barricades – Use of danger/warning signs, sidewalk closure, safety instruction signs, pedestrian fencing and barricades, etc.
- Scaffold – Project specific scaffold types, training, scaffold drawings, competent person, criteria for project specific scaffold, falling object protection.
- Welding and Cutting – project specific procedure for welding and cutting, including all necessary safety requirements such as fire prevention, personal protective equipment, hot work permits, FDNY certificate requirements.
- Fall Protection – Project specific information regarding selected fall protection systems, fall protection plan.
- Cranes, Derrick, Hoists, Elevators, Conveyors – project specific equipment information including type, rated load capacity, manufacture specification requirements, competent person, exposure to falling load, inspection, recordkeeping, clearance requirements, communication procedure, ground lines, permits.
- Excavation Safety – Competent person, project specific protective system.
- Maintenance and Protection of Traffic Plan – Project specific MPT plan, flagmen training.
- Steel Erection – Site specific erection plan, requirements for applicable written notifications, competent person.
- Demolition – Engineering survey, including written evidence, disconnection of all effected utilities, identification of all hazardous chemicals, materials, gases, etc., floor openings, chutes, inspection and maintenance of all stairs/passageways, removal of materials/debris/structural elements, lock out/tag out, competent person.
- Blasting and the Use of Explosives – Project specific safety procedures, warning signs, training/qualification, transportation, storage and use of explosives, inspection.
- Toxic and Hazardous Substances – Safety procedures for substances to be used on project.
- Noise Mitigation Plan – Completed project specific Noise Mitigation Plan.
- Confined Space Program – Project specific Confined Space Program, responsible staff, training records, equipment information, rescue procedure, list of project specific confined spaces, forms.
- Construction Vehicles/Heavy Equipment – Type of construction vehicles/heavy equipment to be used on site.
- Dust Mitigation Plan – Completed project specific Dust Mitigation Plan.

The most critical component of the Site Safety Plan is the Job Hazard Analysis (JHA) section. The JHA form is a written document prepared by the contractor. The contractor must conduct a site and task assessment JHA to identify the major job steps and any potential safety or environmental hazards related to performance of the work, eliminate or implement controls for the potential hazards, and identify proper personal protective equipment for the task. The JHA shall be communicated to all contractor/subcontractor personnel on site.

The initial Job Hazard Assessment form shall be included in the contractor's Site Safety Plan and the current form shall be available at the construction site for reference.

Certain DDC programs, such as Job Order Contracting System (JOCS), may not necessarily require Site Safety Plans. The JOCS contractor shall submit a Safety Program. The Site Safety Plan requirement for the JOCS contractor will be determined by QA&CS based on a project work scope, construction activities and project location. In addition, certain DDC Operating Units may establish client-specific program or safety requirements. The contractor's Site Safety Plan must address such client-specific program or safety requirements.

VII. KICK-OFF MEETINGS/PRE-CONSTRUCTION AND SAFETY REVIEW

RE/CPM shall invite QA&CS Construction Safety Unit to the construction kick-off meeting. A QA&CS representative will participate in this meeting with the Contractor and RE/CPM prior to the start of the project for the purpose of:

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- 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 QA&CS 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:

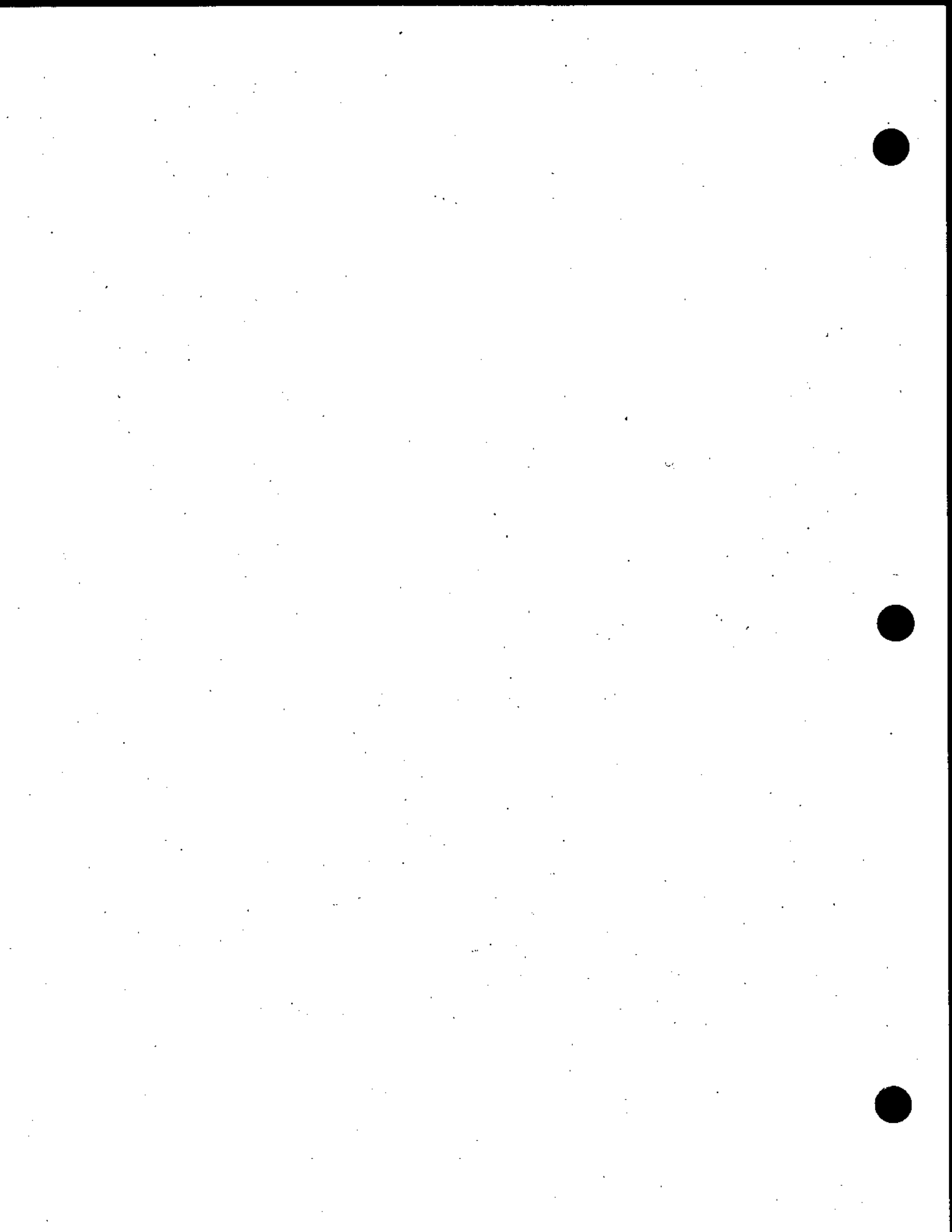
- A. Use of a safety checklist by a representative of the Construction Safety Unit or other designated DDC representative or Consultant during regular, unannounced inspections of the job site. Field Exit Conferences will be held with the RE/CPM, Contractor Project Safety Representatives.
- B. The RE/CPM 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 have these records available upon request. Any critical deficiencies shall be immediately reported to QA&CS 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 - QA&CS, or his/her designee will meet with the Contractor's Project Safety Representative and or Project Safety Manager, the DDC Project Manager, the RE/CPM, and 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 within 1 hour inform the RE/CPM/CM of all accidents/incidents including all fatalities, any injuries to employees or members of the general public, and property damage (e.g., structural damage, equipment rollovers, utility damage, loads dropped from crane). The RE/CPM shall notify the Construction Safety Unit as per DDC's Construction Safety Emergency and Accident Notification and Response Protocol and shall maintain a record of all contractor accidents/incidents for the project.
- F. The Construction Safety Unit shall be notified within two (2) hours of the start of any NYS-DOL/ NYC-COSH/ OSHA/ EPA inspections.

IX. SAFETY PERFORMANCE EVALUATION

The contractor's safety record, including accident/incident history and DDC safety 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 may 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.

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December 2013



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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 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 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 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 or the Order to 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 and/or technical clarifications 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, or his/her duly authorized representative.

2.1.4 **"Allowance"** shall mean a sum of money which the Agency may include in the total amount of the Contract for such specific contingencies as the Agency believes may be necessary to complete the Work, e.g., lead or asbestos remediation, and for which the Contractor will be paid on the basis of stipulated unit prices or a formula set forth in the Contract or negotiated between the parties provided, however, that if the Contractor is not directed to use the Allowance, the Contractor shall have no right to such money and it shall be deducted from the total amount of the Contract.

2.1.5 **"City"** shall mean the City of New York.

2.1.6 **"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, or his/her duly authorized representative.

2.1.7 **"Commissioner"** shall mean the head of the Agency that has entered into this Contract, or his/her duly authorized representative.

2.1.8 **"Comptroller"** shall mean the Comptroller of the City of New York.

2.1.9 **"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.

2.1.10 **"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.

2.1.11 **"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.

2.1.12 **"Contractor"** shall mean the entity which executed this Contract, whether a corporation, firm, partnership, joint venture, individual, or any combination thereof, and its, 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.

2.1.13 **"Days"** shall mean calendar days, except where otherwise specified.

2.1.14 **"Engineer"** or **"Architect"** or **"Project Manager"** shall mean the person so designated in writing by the Commissioner in the Notice to Proceed or the Order to Work to act as such in relation to this Contract, including a private Architect or Engineer or Project Manager, as the case may be. Subject to written approval by the Commissioner, the Engineer, Architect or Project Manager may designate an authorized representative.

2.1.15 **"Engineering Audit Officer" (EAO)** shall mean the person so designated by the Commissioner to perform responsible auditing functions hereunder.

2.1.16 **"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.

2.1.17 **"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.

- 2.1.18 **"Final Acceptance"** shall mean final written acceptance of all the Work by the Commissioner, a copy of which shall be sent to the Contractor.
- 2.1.19 **"Final Approved Punch List"** shall mean a list, approved pursuant to Article 14.2.2, specifying those items of Work to be completed by the Contractor after Substantial Completion and dates for the completion of each item of Work.
- 2.1.20 **"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.
- 2.1.21 **"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.
- 2.1.22 **"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.
- 2.1.23 **"Notice to Proceed"** or **"Order to Work"** shall mean the written notice issued by the Commissioner specifying the time for commencement of the Work and the Engineer, Architect or Project Manager.
- 2.1.24 **"Other Contractor(s)"** shall mean any contractor (other than the entity which executed this Contract or its Subcontractors) who or which has a contract with the City for work on or adjacent to the building or Site of the Work.
- 2.1.25 **"Payroll Taxes"** shall mean State Unemployment Insurance (SUI), Federal Unemployment Insurance (FUI), and payments pursuant to the Federal Insurance Contributions Act (FICA).
- 2.1.26 **"Project"** shall mean the public improvement to which this Contract relates.
- 2.1.27 **"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.
- 2.1.28 **"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.
- 2.1.29 **"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.
- 2.1.30 **"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.
- 2.1.31 **"Small Tools"** shall mean items that are ordinarily required for a worker's job function, including but not limited to, equipment that ordinarily has no licensing, insurance

or substantive storage costs associated with it; such as circular and chain saws, impact drills, threaders, benders, wrenches, socket tools, etc.

2.1.32 "**Specifications**" shall mean all of the directions, requirements, and standards of performance applying to the Work as hereinafter detailed and designated under the Specifications.

2.1.33 "**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, or superintendence, supervision and/or management at the Site. Wherever the word Subcontractor appears, it shall also mean sub-Subcontractor.

2.1.34 "**Substantial Completion**" shall mean the written determination by the Engineer that the Work required under this Contract is substantially, but not entirely, complete and the approval of the **Final Approved Punch List**.

2.1.35 "**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 obtaining any and all permits, certifications and licenses as may be necessary and required to complete the Work, 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 **City Department of Environmental Protection**.

5.3.2 The **Contractor** agrees to comply with Section 24-219 of the 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 **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 **City Department of Environmental Protection**. In addition, the **Contractor's** certified Construction Noise Mitigation Plan is subject inspection by the **City Department of Environmental Protection** in accordance with Section 28-101 of Title 15 of **RCNY**. No **Contract Work** may take place at a **Site** 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 (50) 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 (65) 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 (15 ppm).

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 (30 ppm) to fulfill the requirements of this Article 5.4.2, where the Commissioner of the 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 Agencies and Contractors. Any such determination shall expire after six (6) months unless renewed.

5.4.2(c) Contractors shall not be required to comply with this Article 5.4.2 where the City 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 (30 ppm) 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 (30 ppm) is available. Any finding made pursuant to this Article 5.4.2(c) shall expire after sixty (60) Days, at which time the requirements of this Article 5.4.2 shall be in full force and effect unless the City 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 **City Agency** letting this **Contract**.

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 **City 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 (3) 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 (20) **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)(i) Where the **City 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 this Article 5.4.3 is unavailable for such vehicle, the **Contractor** shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle.

5.4.3(d)(ii) 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, the **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)(iii) In determining which technology to use for the purposes of Articles 5.4.3(d)(i) and 5.4.3(d)(ii) above, the **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)(iv) The **Contractor** 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 **City Agency** letting this **Contract**. Any finding or waiver made or issued pursuant to Articles 5.4.3(d)(i) and 5.4.3(d)(ii) above shall expire after one hundred eighty (180) **Days**, at which time the requirements of Article 5.4.3(a) shall be in full force and effect unless the **City 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. The **Contractor** 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) The **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 (\$1,000) and ten thousand (\$10,000) 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 (\$20,000) 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 **City Agency** the following information:

5.4.6(a)(i) The total number of diesel-powered Nonroad Vehicles used to fulfill the requirements of this Public Works Contract;

5.4.6(a)(ii) The number of such Nonroad Vehicles that were powered by Ultra Low Sulfur Diesel Fuel;

5.4.6(a)(iii) 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(a)(iv) 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(a)(v) The locations where such Nonroad Vehicles were used; and

5.4.6(a)(vi) 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 (30 ppm).

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 during 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 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 (50) horsepower (HP) 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 terms shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five (65) HP 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 (15 ppm).

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 HP rating of fifty (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.

5.7 Waste Treatment, Storage, and Disposal Facilities and Transporters. In connection with the **Work**, the **Contractor** and any **Subcontractor** shall use only those waste treatment, storage, and disposal facilities and waste transporters that possess the requisite license, permit or other governmental approval necessary to treat, store, dispose, or transport the waste, materials or hazardous substances.

5.8 Environmentally Preferable Purchasing. The **Contractor** shall ensure that products purchased or leased by the **Contractor** or any **Subcontractor** for the **Work** that are not specified by the **City** or are submitted as equivalents to a product specified by the **City** comply with the requirements of the New York City Environmentally Preferable Purchasing Program contained in Chapter 11 of Title 43 of the RCNY, pursuant to Chapter 3 of Title 6 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 all persons and the 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 also send written notice of any such event to all insurance carriers that issued potentially responsive policies (including commercial general liability insurance carriers for events relating to the **Contractor's** own employees) no later than twenty (20) days after such event and again no later than twenty (20) days after the initiation of any claim and/or action resulting therefrom. Such notice shall contain the following information: the number of the insurance policy, the name of the Named Insured, the date and location of the incident, and the identity of the persons injured or property damaged. For any policy on which the **City** and/or the **Engineer, Architect, or Project Manager** are Additional Insureds, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Additional Insured, such other Additional Insureds, as well as the Named Insured."

7.3.2(a) Whenever such notice is sent under a policy on which the **City** is an Additional Insured, the **Contractor** shall provide copies of the notice to the **Comptroller, the Commissioner** and the **City Corporation Counsel**. The copy to the **Comptroller** shall be sent to the Insurance Unit, NYC Comptroller's Office, 1 Centre Street – Room 1222, New York, New York, 10007. The copy to the **Commissioner** shall be sent to the address set forth in Schedule A of the General Conditions. The copy to the **City Corporation Counsel** shall be sent to Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department, 100 Church Street, New York, New York 10007.

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 defend, indemnify, and hold the **City**, its employees, and officials (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 provisions of this Article 7 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 the **Work** on the date specified in the **Notice to Proceed** or the **Order to Work**. The time for performance of the **Work** under the **Contract** shall be computed from the date specified in the **Notice to Proceed** or the **Order to Work**. **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 in this **Contract**, 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** or **Order to Work**, unless otherwise directed by the **Engineer**, shall submit to the **Engineer** a proposed progress schedule based on the Critical Path Method 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**, including the anticipated time for obtaining required approvals pursuant to Article 10; 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**, at its sole cost and expense, 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 provide 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 11, 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 Article 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 strictly 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.

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 provided, however, that the amount of compensation due to the **Contractor** will not be determined until the **Commissioner** determines that the **Work** is delayed after the date set for substantial completion.

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 **Commissioner** 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 the **Work** for a period exceeding thirty (30) **Days**, that was not brought about through any action or omission of the **Contractor**.
- 11.4.1.5 Differing site conditions that were neither known nor 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 No claim may be made for any alleged delay in **Substantial Completion** of the **Work** by a date earlier than the date of **Substantial Completion** provided for in Schedule A unless there is a provision in the **Contract** providing for additional compensation for early completion. No claim may be made for any alleged delay in **Substantial Completion** of the **Work** if the work is substantially completed by the date of **Substantial Completion** provided for in Schedule A unless acceleration has been directed by the **Commissioner** to meet the date of **Substantial Completion** set forth in Schedule A.

11.4.3 The provisions of this Article 11 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 Article 11 shall be allowed.

11.5 **Non-Compensable Delays.** The **Contractor** agrees to make no claim for, and is deemed to have 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, lockout or similar situation;

11.5.5 Any shortages of supplies or materials, or unavailability of equipment, 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 God, or acts of war or of the public enemy or terrorist acts, including the **City's** reasonable responses thereto; and

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 start and end dates of the claimed periods of delay and, in addition, a description of the operations that were delayed, an explanation of how they were delayed, and the reasons for the delay, including identifying the applicable act or omission of the **City** listed in Article 11.4.

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 Article 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 Direct labor, including payroll taxes (subject to statutory wage caps) and supplemental benefits, based on time and materials records;

11.7.1.2 Necessary materials (including transportation to the **Site**), based on time and material records;

11.7.1.3 Reasonable rental value of necessary plant and equipment other than small tools, plus fuel/energy costs according to the applicable formula set forth in Articles 26.2.4 and/or 26.2.8, based on time and material records;

11.7.1.4 Insurance and bond costs;

11.7.1.5 Extended field office costs;

11.7.1.6 Extended **Site** overhead; and

11.7.1.7 Extended home office overhead.

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 Articles 11.7.1.1 through 11.7.1.6, and an

additional overhead of five (5%) percent of the costs outlined in Articles 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, pursuant to Article 11.1.3 above, that a compensable delay has occurred and agree on the amount of compensation, payment may be made pursuant to a written change order. Payment pursuant to such change order is subject to pre-audit by the **Engineering Audit Officer**, and may be post-audited by the **Comptroller** and/or the **Agency**.

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** determines 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. The **Contractor** agrees to make no claim against

the City for any damages relating to or arising out of any directions issued by the **Engineer** pursuant to this Article 12 (including but not limited to the failure of any **Other Contractor** to comply or promptly comply with such directions), or the failure of the **Engineer** to issue any 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 the **Contractor's** failure to comply with the **Engineer's** directions 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 **Other 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 action based upon such claim and if any judgment or claim (even if the allegations of the action 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 13 and the PPB Rules.

13.2 Any extension of time may be granted only by the ACCO 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 officials, 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 **ACCO** 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 **ACCO** 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 **ACCO** or the Board on an application for an extension of time shall be binding and conclusive on the **Contractor**.

13.6 The **ACCO** or the Board acting entirely within their discretion may grant an application for an extension of time for causes of delay other than those herein referred.

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 **ACCO** of the condition which allegedly has caused or is causing the delay, and shall submit a written application to the **ACCO** 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 total bid price;

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 **ACCO** 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 **ACCO** 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 **ACCO** 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 **ACCO**, 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 City 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** occasioned by any act or omission to act of the **City** or any of its representatives, except as provided for in Article 11.

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 below have been met.

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 Approved Punch List and Date for Final Acceptance:** Following inspection of the **Work**, the **Engineer** shall furnish the **Contractor** with a final punch list, specifying all items of **Work** to be completed and proposing dates for the completion of each specified item of **Work**. The **Contractor** shall then submit in writing to the **Engineer** within ten (10) **Days** of the **Engineer** furnishing the final punch list either acceptance of the dates or proposed alternative dates for the completion of each specified item of **Work**. If the **Contractor** proposes alternative dates, then, 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, the **Engineer** shall establish dates for the completion of each item of **Work**. If the **Contractor** neither accepts the dates nor proposes alternative dates within ten (10) **Days**, the schedule proposed by the **Engineer** shall be deemed accepted. The latest completion date specified shall be the date for **Final Acceptance** of the **Work**.

14.3 **Date of Substantial Completion.** The date of approval of the **Final Approved Punch List**, shall be the date of **Substantial Completion**. The date of approval of the **Final Approved Punch List** shall be either (a) if the **Contractor** approves the final punch list and proposed dates for completion furnished by the **Engineer**, the date of the **Contractor's** approval; or (b) if the **Contractor** neither accepts the dates nor proposes alternative dates, ten (10) **Days** after the **Engineer** furnishes the **Contractor** with a final punch list and proposed dates for completion; or (c) if the **Contractor** proposes alternative dates, the date that the **Engineer** sends written notification to the **Contractor** either approving the **Contractor's** proposed alternative dates or establishing dates for the completion for each item of **Work**.

14.4 **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**.

14.5 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.

14.6 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.

14.7 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 substantially complete the **Work** within the time fixed for such **Substantial 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 substantially 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 **Substantial 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 15 shall also apply to the **Contractor** whether or not the **Contractor** 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 Article 16. In the event the **Commissioner** takes over, uses, occupies, or operates any part of the **Work**:

16.1.1 the **Engineer** 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; the proposed subcontract if requested by the **Commissioner**; 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 In addition to the requirements in Article 17.2, **Contractor** is required to list the **Subcontractor** in the web based Subcontractor Reporting System through the City's Payee Information Portal (PIP), available at www.nyc.gov/pip.¹ For each **Subcontractor** listed, **Contractor** is required to provide the following information: maximum contract value, description of **Subcontractor's** Work, start and end date of the subcontract and identification of the **Subcontractor's** industry. 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.

Failure of the **Contractor** to list a **Subcontractor** and/or to report **Subcontractor** payments in a timely fashion may result in the **Commissioner** declaring the **Contractor** in default of the **Contract** and will 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**. Article 15 shall govern the issue of liquidated damages.

¹ In order to use the new system, a PIP account will be required. Detailed instructions on creating a PIP account and using the new system are also available at www.nyc.gov/pip. Additional assistance with PIP may be obtained by emailing the Financial Information Services Agency Help Desk at pip@fisa.nyc.gov.

17.4 If an approved **Subcontractor** elects to subcontract any portion of its subcontract, the proposed sub-subcontract shall be submitted in the same manner as directed above.

17.5 The **Commissioner** will notify the **Contractor** in writing whether the proposed **Subcontractor** is approved. If the proposed **Subcontractor** is not approved, the **Contractor** may submit another proposed **Subcontractor** unless the **Contractor** decides to do the **Work**. No **Subcontractor** shall be permitted to enter or perform any work on the **Site** unless approved.

17.6 Before entering into any subcontract hereunder, the **Contractor** shall provide the proposed **Subcontractor** with a complete copy of this document and inform the proposed **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**.

17.7 Documents given to a prospective **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.

17.8 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.

17.9 If the **Subcontractor** fails to maintain the necessary facilities, skill, integrity, past experience, and financial resources (other than due to the **Contractor's** failure to make payments where required) to perform the **Work** in accordance with the terms and conditions of this **Contract**, the **Contractor** shall promptly notify the **Commissioner** and replace such **Subcontractor** with a newly approved **Subcontractor** in accordance with this Article 17.

17.10 The **Contractor** shall be responsible for ensuring that all **Subcontractors** performing **Work** at the **Site** maintain all insurance required by **Law**.

17.11 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:

17.11.1 **Payment to Subcontractors:** The agreement between the **Contractor** and its **Subcontractor** 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**.

17.11.2 **Prevailing Rate of Wages:** The agreement between the **Contractor** and its **Subcontractor** shall include the prevailing wage rates and supplemental benefits to be paid in accordance with Labor Law Section 220.

17.11.3 **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 a **Subcontractor** in excess of fifty thousand (\$50,000) dollars 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.*).

17.11.4 All requirements required pursuant to federal and/or state grant agreement(s), if applicable to the **Work**.

17.12 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 resolved.

17.13 On contracts where 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.

17.14 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, conveyance or other disposition of this **Contract** shall not be valid until filed in the office of the **Commissioner** and the **Comptroller**, 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, conveyance or other disposition, 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 GUARANTEE**

ARTICLE 19. SECURITY DEPOSIT

19.1 If performance and payment bonds are required, the City shall retain the bid security to ensure that the successful bidder executes the **Contract** and furnishes the required payment and performance security within ten (10) **Days** after notice of the award of the **Contract**. If the successful bidder fails to execute the **Contract** and furnish the required payment and performance security, the City shall retain such bid security as set forth in the Information for Bidders. If the successful bidder executes the **Contract** and furnishes the required payment and performance security, the City shall return the bid security within a reasonable time after the furnishing of such bonds and execution of the **Contract** by the City.

19.2 If performance and payment bonds are not required, the bid security shall be retained by the City as security for the Contractor's faithful performance of the **Contract**. If partial payments are provided, the bid security will be returned to the Contractor after the sum retained under Article 21 equals the amount of the bid security, subject to other provisions of this **Contract**. If partial payments are not provided, the bid security will be released when final payment is certified by the City for payment.

19.3 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:

19.3.1 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

19.3.2 To indemnify the City against any and all claims.

ARTICLE 20. PAYMENT GUARANTEE

20.1 On **Contracts** where one hundred (100%) percent performance bonds and payment bonds are executed, this Article 20 does not apply.

20.2 In the event the terms of this **Contract** do not require the Contractor to provide a payment bond or where the **Contract** does not require a payment bond for one hundred (100%) percent of the **Contract** price, the City shall, in accordance with the terms of this Article 20, guarantee payment of all lawful claims 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 If the **Contractor** provides a payment bond for a value that is less than one hundred (100%) percent of the value of the **Contract Work**, the payment bond provided by the **Contractor** shall be primary (and non-contributing) to the payment guarantee provided under this Article 20.

20.3.2 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 Article 20.3.4 and 20.3.5.

20.3.3 Nothing in this Article 20 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**.

20.3.4 Every person who has furnished labor or material, to the **Contractor** or to a **Subcontractor** of the **Contractor**, in the prosecution of the **Work** and who has not been paid in full therefor before the expiration of a period of ninety (90) **Days** after the date on which the last of the labor was performed or material was furnished by him/her for which the claim is made, shall have the right to sue on this payment guarantee in his/her own name for the amount, or the balance thereof, unpaid at the time of commencement of the action; provided, however, that a person having a direct contractual relationship with a **Subcontractor** of the **Contractor** but no contractual relationship express or implied with the **Contractor** shall not have a right of action upon the guarantee unless he/she shall have given written notice to the **Contractor** within one hundred twenty (120) **Days** from the date on which the last of the labor was performed or the last of the material was furnished, for which his/her claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the material was furnished or for whom the labor was performed. The notice shall be served by delivering the same personally to the **Contractor** or by mailing the same by registered mail, postage prepaid, in an envelope addressed to the **Contractor** at any place where it maintains an office or conducts its business; provided, however, that where such notice is actually received by the **Contractor** by other means, such notice shall be deemed sufficient.

20.3.5 Except as provided in Labor Law Section 220-g, no action on this payment guarantee shall be commenced after the expiration of the one-year limitations period set forth in Section 137(4)(b) of the State Finance Law.

20.3.6 The **Contractor** shall promptly forward to the **City** any notice or demand received pursuant to Article 20.3.4. The **Contractor** shall inform the **City** of any defenses to the notice or demand and shall forward to the **City** any documents the **City** requests concerning the notice or demand.

20.3.7 All demands made against the **City** by a beneficiary of this payment guarantee shall be presented to the **Engineer** along with all written documentation concerning the demand which the **Engineer** deems reasonably 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.

20.3.8 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.

20.3.9 No beneficiary shall be entitled to interest from the **City**, or to any other costs, including, but not limited to, attorneys' fees, except to the extent required by State Finance Law Section 137.

20.4 Upon the receipt by the **City** of a demand pursuant to this Article 20, 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.

20.4.2 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**.

20.4.3 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 claim or an action has been filed, the terms and conditions set forth in Article 23 shall apply. In the event a lien has been filed, the parties will be governed by the provisions of the Lien Law of the State of New York.

20.5 The provisions of this Article 20 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 20, 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 20 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 20 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 its **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 20 within the one-year limitations period set forth in Section 137(4)(b).

ARTICLE 21. RETAINED PERCENTAGE

21.1 If this **Contract** requires one hundred (100%) percent 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 one hundred (100%) percent performance and payment security and if the price for which this **Contract** was awarded does not exceed one million (\$1,000,000) dollars, 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.

21.3 If this **Contract** does not require one hundred (100%) percent performance and payment security and if the price for which this **Contract** was awarded exceeds one million (\$1,000,000) dollars, 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: The **Contractor** shall procure 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 maintained 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**), except for insurance required pursuant to Article 22.1.4, which may terminate upon **Substantial Completion** of the **Contract**. All insurance shall meet the requirements set forth in this Article 22. Wherever this Article requires that insurance coverage be "at least as broad" as a specified form (including all ISO forms), there is no obligation that the form itself be used, provided that the **Contractor** can demonstrate that the alternative form or endorsement contained in its policy provides coverage at least as broad as the specified form.

22.1.1 Commercial General Liability Insurance: The **Contractor** shall provide Commercial General Liability Insurance covering claims for property damage and/or bodily injury, including death, which may arise from any of the operations under this **Contract**. Coverage under this insurance shall be at least as broad as that provided by the latest edition of Insurance Services Office ("ISO") Form CG 0001. Such insurance shall be "occurrence" based rather than "claims-made" and 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; independent contractors; explosion, collapse and underground (XCU); construction means and methods; and incidental malpractice. Such insurance shall contain a "per project" aggregate limit, as specified in Schedule A, that applies separately to operations under this **Contract**.

22.1.1(a) Such Commercial General Liability Insurance shall name the City as an Additional Insured. Coverage for the City shall specifically include the City's officials and employees, be at least as broad as the latest edition of ISO Form CG 20 10 and provide completed operations coverage at least as broad as the latest edition of ISO Form CG 20 37.

22.1.1(b) Such Commercial General Liability Insurance shall name all other entities designated as additional insureds in Schedule A but only for claims arising from the Contractor's operations under this Contract, with coverage at least as broad as the latest edition of ISO Form CG 20 26.

22.1.1(c) If the Work requires a permit from the Department of Buildings pursuant to 1 RCNY Section 101-08, at http://www.nyc.gov/html/dob/downloads/rules/1_RCNY_101-08.pdf, the Contractor shall provide Commercial General Liability Insurance with limits of at least those required by 1 RCNY section 101-08. If the Work does not require such a permit, the minimum limits shall be those provided for in Schedule A.

22.1.1(d) If any of the Work includes repair of a waterborne vessel owned by or to be delivered to the City, such Commercial General Liability shall include, or be endorsed to include, Ship Repairer's Legal Liability Coverage to protect against, without limitation, liability arising from navigation of such vessels prior to delivery to and acceptance by the City.

22.1.2 Workers' Compensation Insurance, Employers' Liability Insurance, and Disability Benefits Insurance: The Contractor shall provide, and shall cause its Subcontractors to provide, Workers Compensation Insurance, Employers' Liability 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 employees, if any, for which the Laws require insurance only pursuant to Article 22.1.3).

22.1.3 United States Longshoremen's and Harbor Workers Act and/or Jones Act Insurance: If specified in Schedule A of the General Conditions or if required by Law, the Contractor shall provide 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.

22.1.4 Builders Risk Insurance: If specified in Schedule A of the General Conditions, the Contractor shall provide Builders Risk Insurance on a completed value form for the total value of the Work through Substantial Completion of the Work in its entirety. Such insurance shall be provided on an All Risk basis and include coverage, without limitation, for windstorm (including named windstorm), storm surge, flood and earth movement. Unless waived by the Commissioner, it shall include coverage for ordinance and law, demolition and increased costs of construction, debris removal, pollutant clean up and removal, and expediting costs. Such insurance shall cover, without limitation, (a) all buildings and/or structures involved in the Work, as well as temporary structures at the Site, and (b) any property that is intended to become a permanent part of such building or structure, whether such property is on the Site, in transit or in temporary storage. Policies shall name the Contractor as Named Insured and list the City as both an Additional Insured and a Loss Payee as its interest may appear.

22.1.4(a) Policies of such insurance shall specify that, in the event a loss occurs at an occupied facility, occupancy of such facility is permitted without the consent of the issuing insurance company.

22.1.4(b) Such insurance may be provided through an Installation Floater, at the Contractor's option, if it otherwise conforms with the requirements of this Article 22.1.4.

22.1.5 Commercial Automobile Liability Insurance: The Contractor shall provide Commercial Automobile Liability Insurance for liability arising out of ownership, maintenance or use of any owned (if any), non-owned and hired vehicles to be used in connection with this Contract. Coverage shall be at least as broad as the latest edition of ISO Form CA0001. If vehicles 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.

22.1.6 Contractors Pollution Liability Insurance: If specified in Schedule A of the General Conditions, the Contractor shall maintain, or cause the Subcontractor doing such Work to maintain, Contractors Pollution Liability Insurance covering bodily injury and property damage. 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, action, or proceedings arising from the operations under this Contract. Such insurance shall be in the Contractor's name and list the City as an Additional Insured and any other entity specified in Schedule A. Coverage shall include, without limitation, (a) loss of use of damaged property or of property that has not been physically injured, (b) transportation, and (c) non-owned disposal sites.

22.1.6(a) Coverage for the City as Additional Insured shall specifically include the City's officials and employees and be at least as broad as provided to the Contractor for this Project.

22.1.6(b) If such insurance 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 (3) years from the time the Work under this Contract is completed.

22.1.7 Marine Insurance:

22.1.7(a) Marine Protection and Indemnity Insurance: If specified in Schedule A of the General Conditions or if the Contractor engages in marine operations in the execution of any part of the Work, the Contractor shall maintain, or cause the Subcontractor doing such Work to maintain, Marine Protection and Indemnity Insurance with coverage at least as broad as Form SP-23. The insurance shall provide coverage for the Contractor or Subcontractor (whichever is doing this Work) and for the City (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured for bodily injury and property damage arising from marine operations under this Contract. Coverage shall include, without limitation, injury or death of crew members (if not fully provided through other insurance), removal of wreck, damage to piers, wharves and other fixed or floating objects and loss of or damage to any other vessel or craft, or to property on such other vessel or craft.

22.1.7(b) **Hull and Machinery Insurance:** If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work** to maintain, Hull and Machinery Insurance with coverage for the **Contractor** or **Subcontractor** (whichever is doing this **Work**) and for the **City** (together with its officials and employees) as Additional Insured at least as broad as the latest edition of American Institute Tug Form for all tugs used under this **Contract** and Collision Liability at least as broad as the latest edition of American Institute Hull Clauses.

22.1.7(c) **Marine Pollution Liability Insurance:** If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work** to maintain, Marine Pollution Liability Insurance covering itself (or the **Subcontractor** doing such **Work**) as Named Insured and the **City** (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured. Coverage shall be at least as broad as that provided by the latest edition of Water Quality Insurance Syndicate Form and include, without limitation, 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.

22.1.8 The **Contractor** shall provide such other types of insurance, at such minimum limits and with such conditions, as are specified in Schedule A of the General Conditions.

22.2 General Requirements for Insurance Coverage and 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 A, unless prior written approval is obtained from the **City** Corporation Counsel.

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 **City** 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 The **Contractor** may satisfy its insurance obligations under this Article 22 through primary policies or a combination of primary and excess/umbrella policies, so long as all policies provide the scope of coverage required herein.

22.2.6 Policies of insurance provided pursuant to this Article 22 shall be primary and non-contributing to any insurance or self-insurance maintained by the **City**.

22.3 Proof of Insurance:

22.3.1 For all types of insurance required by Article 22.1 and Schedule A, except for insurance required by Articles 22.1.4 and 22.1.7, the **Contractor** shall file proof of insurance in accordance with this Article 22.3 within ten (10) **Days** of award. For insurance provided pursuant to Articles 22.1.4 and 22.1.7, proof shall be filed by a date specified by the **Commissioner** or ten (10) **Days** prior to the commencement of the portion of the **Work** covered by such policy, whichever is earlier.

22.3.2 For Workers' Compensation Insurance provided pursuant to Article 22.1.2, the **Contractor** shall submit one of the following forms: C-105.2 Certificate of Workers' Compensation Insurance; U-26.3 - State Insurance Fund Certificate of Workers' Compensation Insurance; Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. For Disability Benefits Insurance provided pursuant to Article 22.1.2, the **Contractor** shall submit DB-120.1 - Certificate Of Insurance Coverage Under The NYS Disability Benefits Law, Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. ACORD forms are not acceptable.

22.3.3 For policies provided pursuant to all of Article 22.1 other than Article 22.1.2, the **Contractor** shall submit one or more Certificates of Insurance on forms acceptable to the **Commissioner**. All such Certificates of Insurance shall certify (a) the issuance and effectiveness of such policies of insurance, each with the specified minimum limits (b) for insurance secured pursuant to Article 22.1.1 that the **City** and any other entity specified in Schedule A is an Additional Insured with coverage at least as broad as the most recent edition of ISO Forms CG 20 10, CG 20 37, and CG 20 26, as applicable; (c) in the event insurance is required pursuant to Article 22.1.6 and/or Article 22.1.7, that the **City** is an Additional Insured thereunder; (d) the company code issued to the insurance company by the National Association of Insurance Commissioners (the NAIC number); and (e) the number assigned to the **Contract** by the **City**. All such Certificates of Insurance shall be accompanied by either a duly executed "Certification by Broker" in the form contained in Part III of Schedule A or copies of all policies referenced in such Certificate of Insurance as certified by an authorized representative of the issuing insurance carrier. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

22.3.4 Documentation confirming renewals of insurance shall be submitted to the **Commissioner** prior to the expiration date of coverage of policies required under this **Contract**. Such proofs of insurance shall comply with the requirements of Articles 22.3.2 and 22.3.3.

22.3.5 The **Contractor** shall be obligated to provide the **City** with a copy of any policy of insurance provided pursuant to this Article 22 upon the demand for such policy by the **Commissioner** or the **City** Corporation Counsel.

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 does not excuse the **Contractor** from securing insurance

consistent with all provisions of this Article 22 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.

22.4.4 In the event the **Contractor** receives notice, from an insurance company or other person, that any insurance policy required under this Article 22 shall be cancelled or terminated (or has been cancelled or terminated) for any reason, the **Contractor** shall immediately forward a copy of such notice to both the **Commissioner** and the New York City Comptroller, attn: Office of Contract Administration, Municipal Building, One Centre Street, room 1005, New York, New York 10007. Notwithstanding the foregoing, the **Contractor** shall ensure that there is no interruption in any of the insurance coverage required under this Article 22.

22.4.5 Where notice of loss, damage, occurrence, accident, claim or suit is required under an insurance policy maintained in accordance with this Article 22, the **Contractor** shall notify in writing all insurance carriers that issued potentially responsive policies of any such event relating to any operations under this **Contract** (including notice to Commercial General Liability insurance carriers for events relating to the **Contractor's** own employees) no later than 20 days after such event. For any policy where the City is an Additional Insured, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Insured as well as the Named Insured." Such notice shall also contain the following information: the number of the insurance policy, the name of the named insured, the date and location of the damage, occurrence, or accident, and the identity of the persons or things injured, damaged or lost. The **Contractor** shall simultaneously send a copy of such notice to the City of New York c/o Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department, 100 Church Street, New York, New York 10007.

22.4.6 In the event of any loss, accident, claim, action, or other event that does or can give rise to a claim under any insurance policy required under this Article 22, the **Contractor** shall at all times fully cooperate with the City with regard to such potential or actual claim.

22.5 **Subcontractor Insurance:** In the event the **Contractor** requires any **Subcontractor** to procure insurance with regard to any operations under this **Contract** and requires such **Subcontractor** to name the **Contractor** as an **Additional Insured** thereunder, the **Contractor** shall ensure that the **Subcontractor** name the City, including its officials and employees, as an **Additional Insured** with coverage at least as broad as the most recent edition of ISO Form CG 20 26.

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 Apart from damages or losses covered by insurance provided pursuant to Articles 22.1.2, 22.1.3, or 22.1.5, the **Contractor** waives all rights against the **City**, including its officials and employees, for any damages or losses that are covered under any insurance required under this Article 22 (whether or not such insurance is actually procured or claims are paid thereunder) or any other insurance applicable to the operations of the **Contractor** and/or its employees, agents, or **Subcontractors**.

22.8 In the event the **Contractor** utilizes a self-insurance program to satisfy any of the requirements of this Article 22, the **Contractor** shall ensure that any such self-insurance program provides the **City** with all rights that would be provided by traditional insurance under this Article 22, including but not limited to the defense and indemnification obligations that insurers are required to undertake in liability policies.

22.9 Materiality/Non-Waiver: The **Contractor's** failure to secure policies in complete conformity with this Article 22, or to give an insurance company timely notice of any sort required in this **Contract** or to do anything else required by this Article 22 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.

22.10 Pursuant to General Municipal Law Section 108, this **Contract** shall be void and of no effect unless **Contractor** maintains Workers' Compensation Insurance for the term of this **Contract** to the extent required and in compliance with the New York State Workers' Compensation Law.

22.11 Other Remedies: Insurance coverage provided pursuant to this Article 22 or otherwise shall not relieve the **Contractor** of any liability under this **Contract**, nor shall it preclude the **City** from exercising any rights or taking such other actions 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 23, and return the balance, if any, without interest, to the **Contractor**.

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 guaranty are provided for in Schedule A.

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 of such equipment and materials or lessees of the premises into which the equipment and materials have been installed.

**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 **Law** 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 **Agency**.

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 the basis of time and material records 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 based on time and material records 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, calculated in accordance with the formula specified therein, if any.

26.2.1 Necessary materials (including transportation to the Site); plus

26.2.2 Necessary direct labor, including payroll taxes (subject to statutory wage caps) 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** (or **Subcontractor-owned**, as applicable), 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 Equipment Watch (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 Equipment Watch (the "Blue Book") (the applicable Blue Book rate being for rental only without the addition of any operational costs listed in the Blue Book). The reasonable rental value is deemed to be 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 (75%) percent of such rental rates; second shift shall be sixty (60%) percent of the first shift rate; and third shift shall be forty (40%) percent of the first shift rate. Equipment on standby shall be reimbursed at one-third (1/3) the prorated monthly rental rate. **Contractor-owned** (or **Subcontractor-owned**, as applicable) equipment includes equipment from rental companies affiliated with or controlled by the **Contractor** (or **Subcontractor**, as applicable), as determined by the **Commissioner**. In establishing cost reimbursement for non-operating **Contractor-owned** (or **Subcontractor-owned**, as applicable) 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** (or non-**Subcontractor-owned**, as applicable) 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 Necessary fees charged by governmental entities; plus

26.2.7 Necessary construction-related service fees charged by non-governmental entities, such as landfill tipping fees; plus

26.2.8 Reasonable rental costs of non-Contractor-owned (or non-Subcontractor-owned, as applicable) 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

26.2.9 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 is subject to applicable payroll limitation caps and shall be based upon the carrier's Manual Rate for such insurance derived from the applicable class Loss Cost ("LC") and carrier's Lost Cost Multiplier ("LCM") approved by the New York State Department of Financial Services, and with the exception of experience rating, rate modifiers as promulgated by the New York Compensation Insurance Rating Board ("NYCIRB"); plus

26.2.10 Additional costs incurred as a result of the **Extra Work** for performance and payment bonds; plus

26.2.11 Twelve percent (12%) 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

26.2.12 Ten (10%) percent of the total of items in Articles 26.2.1 through 26.2.5, plus the items in Article 26.2.11, 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

26.2.13 Five (5%) percent of the total of items in Articles 26.2.6 through 26.2.10 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**.

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 27.1 that arise under, or by virtue of, this **Contract** shall be finally resolved in accordance with the provisions of this Article 27 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 27 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 27 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 27 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 27 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 27, 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 dispute 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 **Other Contractor** thus brought into the dispute resolution proceeding shall have the same rights and obligations under this Article 27 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's 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 27. 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 **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 Sections 7-201 and 7-203 of the 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 this 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 27 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;

27.6.2 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

27.6.3 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 27, 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 City 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 City 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 City 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 City 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 City Corporation Counsel, the **CCPO**, 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 Law 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.

27.8 Any termination, cancellation, or alleged breach of the Contract prior to or during the pendency of any proceedings pursuant to this Article 27 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 27.

ARTICLE 28. RECORD KEEPING FOR EXTRA OR DISPUTED WORK OR WORK ON A TIME & MATERIALS BASIS

28.1 While the Contractor or any of its Subcontractors is performing Work on a time and material basis or Extra Work on a time and material basis ordered by the Commissioner under Article 25, or where the Contractor believes that it or any of its Subcontractors is performing Extra Work but a final determination by Agency has not been made, or the Contractor or any of its Subcontractors is performing disputed Work (whether on or off the Site), or complying with a determination or order under protest in accordance with Articles 11, 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, trade, 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 Work** 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 strictly 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.

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, and 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 30, 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, and 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** 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** 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.

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 30 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** pursuant 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**, official, 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 **Engineer**, the **Resident Engineer**, or any other official, 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 (\$250,000) 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 (10) hours in duration.

35.3 In accordance with Local Law Nos. 30-2012 and 33-2012, codified at sections 6-132 and 12-113 of the Administrative Code, respectively,

35.3.1 The **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 (a) the Commissioner of the Department of Investigation, (b) a member of the New York City Council, the Public Advocate, or the **Comptroller**, or (c) the **CCPO**, **ACCO**, **Agency head**, or **Commissioner**.

35.3.2 If any of the **Contractor's** officers or employees believes that he or she has been the subject of an adverse personnel action in violation of Article 35.3.1, he or she shall be entitled to bring a cause of action against the **Contractor** to recover all relief necessary to make him or her whole. Such relief may include but is not limited to: (a) an injunction to restrain continued retaliation, (b) reinstatement to the position such employee would have had but for the retaliation or to an equivalent position, (c) reinstatement of full fringe benefits and seniority rights, (d) payment of two times back pay, plus interest, and (e) compensation for any special damages sustained as a result of the retaliation, including litigation costs and reasonable attorney's fees.

35.3.3 The **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:

35.3.3(a) 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

35.3.3(b) the rights and remedies afforded to its employees under 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**.

35.3.4 For the purposes of this Article 35.3, "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.

35.3.5 This Article 35.3 is applicable to all of the Contractor's Subcontractors having subcontracts with a value in excess of \$100,000; accordingly, the Contractor shall include this rider in all subcontracts with a value a value in excess of \$100,000.

35.4 Article 35.3 is not applicable to this Contract if it is valued at \$100,000 or less. Articles 35.3.1, 35.3.2, 35.3.4, and 35.3.5 are not applicable to this Contract if it was solicited pursuant to a finding of an emergency.

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.

36.1.5 This Article 36 covers all construction, alteration and repair of any public building or public work occurring in the State of New York and the manufacture, sale, and distribution of materials, equipment, and supplies to the extent that such operations are performed within the State of New York pursuant to this Contract.

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 Article 36.2 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, before the award of the **Contract**, all information and reports, including an employment report, that are required by E.O. 50, the rules and regulations promulgated thereunder, and orders of the City 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.

In addition to any actions taken under this **Contract**, failure to comply with E.O. 50 and the rules and regulations promulgated thereunder, in one or more instances, may result in a **City Agency** declaring the **Contractor** to be non-responsible in future procurements. 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 8 of the Administrative Code; and

36.5.2 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 Sections 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) **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.

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 37.3.

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 prevailing wage scale as provided in Labor Law section 220, as amended, or

37.4.1(b) 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) or minimum wages (Article 37.2.6) provisions, the party responsible therefor 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 actions brought by the **City** Corporation Counsel in the name of the **City**, in addition to damages for any other breach of this **Contract**, for 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 37.4 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 37.4 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 37.4, whether such failures were concurrent or consecutive and whether or not such final determinations concerning separate public works projects are rendered simultaneously, such **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public works 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 works 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 37.4 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 works 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 (\$250,000) dollars, such notice shall also include a statement that each worker, laborer or mechanic must 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 (10) 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 37.6.3, which signed statement shall be maintained with the payroll records required by this Contract; and

37.6.3(a) 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:** The **Contractor** shall provide laminated identification badges which include a photograph of the worker's, laborer's or mechanic's face and indicate the worker's, laborer's or mechanic's name, trade, employer's name, and employment starting date (month/day/year). Further, the **Contractor** shall 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. The **Commissioner** may grant a written waiver from the requirement that the laminated identification badge include a photograph if the **Contractor** demonstrates that the identity of an individual wearing a laminated identification badge can be easily verified by another method; 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 described in Article 37.6.1 in that language or languages as may be required. The **Contractor** is responsible for all distributions under this 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 The **Contractor** and **Subcontractor(s)** shall pay employees by check or direct deposit. If this Contract is for an amount greater than one million (\$1,000,000) dollars, 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 seven hundred fifty thousand (\$750,000) dollars, 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** 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. The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of this Article 37.7 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the Contract.

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 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 from 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** and its **Subcontractor(s)** shall maintain on the **Site** during the performance of the **Work** the original payrolls or transcripts thereof which the **Contractor** and its **Subcontractor(s)** are required to maintain and shall submit such original payrolls or transcripts, subscribed and affirmed by it as true, within thirty (30) **Days** after issuance of its first payroll, and every thirty (30) **Days** thereafter, pursuant to Labor Law Section 220(3-a)(a)(iii). The **Contractor** and **Subcontractor(s)** shall submit such original payrolls or transcripts along with each and every payment requisition. If payment requisitions are not submitted at least once a month, the **Contractor** and its **Subcontractor(s)** shall submit original payrolls and transcripts both along with its payment requisitions and independently of its payment requisitions.

38.2 The **Contractor** shall maintain payrolls or transcripts thereof for six (6) years from the date of completion of the **Work** on this **Contract**. If such payrolls and transcripts are maintained outside of New York City after the completion of the **Work** and their production is required pursuant to this Article 38, the **Contractor** shall produce such records in New York City upon request by the **City**.

38.3 The **Contractor** and **Subcontractor(s)** shall comply with any written order, direction, or request made by the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law Investigator(s)**, or the **Comptroller**, to provide to the requesting party any of the following information and/or records within five (5) **Days** of such written order, direction, or request:

38.3.1 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; and/or

38.3.2 Attendance sheets for each **Day** on which any employee of the **Contractor** and/or any of the **Subcontractor(s)** performed **Work** on the **Site**, which attendance sheet shall be in a form acceptable to the **Agency** and shall provide information acceptable to the **Agency** to identify each such employee; and/or

38.3.3 Any other information to satisfy the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law Investigator(s)** or the **Comptroller**, that this Chapter VIII and the Labor Law, as to the hours of employment and prevailing rates of wages and/or supplemental benefits, are being observed.

38.4 The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of Articles 38.1 and/or 38.2 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

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** voidable at the sole discretion of the **City**.

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 for 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** or **Order to Work**, 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 each calendar month (except where the **Commissioner** approves in writing the submission of invoices on a more frequent basis and for invoices relating to **Work** performed pursuant to a change order), 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 a satisfactory payment application, and within sixty (60) **Days** after receipt of a satisfactory payment application in relation to **Work** performed pursuant to a change order, 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 the **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(s) 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 this Article 43.5, then the **Contractor** shall pay interest on amounts due to such **Subcontractor** or **Materialman** at the 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 New York General Business Law. Accrual of interest shall commence on the **Day** immediately following the expiration of the seventh **Day** following receipt of payment by the **Contractor** from 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 **Materialmen** 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 The **Contractor** shall submit with the **Substantial Completion** requisition:

44.1.1 A final verified statement of any pending Article 27 disputes in accordance with the **PPB Rules** and this **Contract** and any and all alleged claims against the **City**, 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.

44.1.1(a) With respect to each such claim, the **Commissioner**, the **Comptroller** and, in the event of litigation, the **City Corporation Counsel** 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 44.1.1(a) 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 44, will have waived any such claims.

44.1.2 A Final Approved Punch List.

44.1.3 Where required, a request for an extension of time to achieve **Substantial Completion** or final extension of time.

44.2 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 44 where the **Contractor** failed 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.

44.3 No further partial payments shall be made to the **Contractor** after **Substantial Completion**, except the **Substantial Completion** payment and payment pursuant to any **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.

44.4 The **Contractor** acknowledges that nothing contained in this Article 44 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. Such submission shall be within 90 days of the date of the **Commissioner's** written determination of **Final Acceptance**, or within such additional time as may be granted by the **Commissioner** in writing. If the **Contractor** fails to submit all required certificates and documents within the time allowed, no payment of the balance claimed shall be made to the **Contractor** and the **Contractor** shall be deemed to have forfeited its right to

payment of any balance claimed. 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 pending dispute resolution procedures in accordance with the **PPB Rules** and this **Contract** and any and all alleged claims against the **City**, 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 **City Corporation Counsel** 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 45.2, 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 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 45 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 of 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 officials, 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 46, or those for amounts deducted by the Commissioner from the final requisition or 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 official, 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 by this Article 46 from commencing an action for breach of Contract to the extent permitted by Law and by the terms of the Contract for any claims that are contained in the verified statement filed with the Contractor's substantial and final requisitions pursuant to Articles 44 and 45 or that arose after submission of the final payment requisition, 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 making of such final payment by electronic funds transfer (EFT) or 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 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; or if

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 the **Contractor** 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 an action 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 provisions 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 be completed 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 expense of completion permitted under Article 54.1, 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**.

54.3 The previous provisions of this Chapter X shall be in addition to any and all other remedies available under **Law** or in equity.

54.4 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**.

**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 action, 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 action be instituted or maintained on any such claims unless such action is commenced within six (6) months after **Substantial Completion**; except that:

56.2.1 Any claims arising out of events occurring after **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 otherwise become 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 action 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 defend, indemnify, and hold the **City** harmless from any and all claims (even if the allegations of the lawsuit are without merit) and judgments for damages and from costs and expenses to which the **City** may be subject to or which it may suffer or incur allegedly arising out of or in connection with any infringement by the **Contractor** of any copyright, trade secrets, trademark or patent rights or any other property or personal right of any third party by the **Contractor** and/or its **Subcontractors** in the performance or completion of the **Work**. Insofar as the facts or **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 permitted by **Law**.

ARTICLE 58. NO CLAIM AGAINST OFFICIALS, AGENTS OR EMPLOYEES

58.1 No claim whatsoever shall be made by the **Contractor** against any official, 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. SERVICE OF NOTICES

59.1 The **Contractor** hereby designates the business address, fax number, and email 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. Any notice, direction, or communication from either party to the other shall be in writing and shall be deemed to have been given when (i) delivered personally; (ii) sent by certified mail, return receipt requested; (iii) delivered by overnight or same day courier service in a properly addressed envelope with confirmation; or (iv) sent by fax or email and, unless receipt of the fax or e-mail is acknowledged by the recipient by fax or e-mail, deposited in a post office box regularly maintained by the United States Postal Service in a properly addressed, postage pre-paid envelope.

59.2 **Contractor's** notice address, email address, or fax number 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, and local taxes, including sales and compensating use taxes of the State of New York and its cities and counties on all tangible personal property 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**, **Subcontractor** or **Materialman** or to tangible personal property which, even

though it is consumed, is not incorporated into the completed **Work** (consumable supplies) and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**. The **Contractor** and its **Subcontractors** and **Materialmen** shall be responsible for and pay any and all applicable taxes, including sales and compensating use taxes, on such leased tools, machinery, equipment or other property and upon all such consumable supplies and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**.

62.2 The **Contractor** agrees to sell and the **City** agrees to purchase all tangible personal property, other than consumable supplies and other tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**, that is 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 tangible personal property shall be in full payment and consideration for the sale of such tangible personal property.

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, and services, 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**, labor, and services.

62.3 20 NYCRR Section 541.3(d) provides that a **Contractor's** purchases of tangible personal property that is either incorporated into real property owned by a governmental entity or purchased for and sold to a governmental entity are exempt from sales and use tax. The **City** shall not pay sales tax for any such tangible personal property that it purchases from the **Contractor** pursuant to the **Contract**. With respect to such tangible personal property, 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 tangible personal property, free of liens and/or encumbrances, and the **Contractor** shall mark or otherwise identify all such tangible personal property as the property of the **City**.

62.4 Title to all tangible personal property 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 tangible personal property to the **Site**. Notwithstanding such transfer of title, the **Contractor** shall have the full and continuing responsibility to install such tangible personal property in accordance with the provisions of this **Contract**, protect it, maintain it in a proper condition and forthwith repair, replace and make good any damage thereto, theft or disappearance thereof, and furnish additional tangible personal property 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 the tangible personal property is rejected as being defective or otherwise unsatisfactory, title to all such tangible personal property shall be deemed to have been transferred back to the **Contractor**.

62.5 The purchase by **Subcontractors** or **Materialmen** of tangible personal property to be sold hereunder shall be a purchase or procurement for resale to the **Contractor** (either directly or through other **Subcontractors**) and therefore not subject to the aforesaid sales and compensating use taxes, provided that the subcontracts and purchase agreements provide for the resale of such tangible personal property and that such subcontracts and purchase agreements are in a form similar to this **Contract** with respect to the separation of the sale of consumable supplies and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work** from the **Work** and labor, services, and any other matters to be provided, and provided further that the subcontracts and

purchase agreements provide separate prices for tangible personal property and all other services and matters. Such separation shall actually be followed in practice, including the separation of payments for tangible personal property from the payments for other **Work** and labor and other things to be provided.

62.6 The **Contractor** and its **Subcontractors** and **Materialmen** shall furnish a **Contractor Exempt Purchase Certificate** to all persons, firms or corporations from which they purchase tangible personal property for the performance of the **Work** covered by this **Contract**.

62.7 In the event any of the provisions of this Article 62 shall be deemed to be in conflict with any other provisions of this **Contract** or create any ambiguity, then the provisions of this Article 62 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 Contract, 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 in this Article 63 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 in this Article 63 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 in this Article 63 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 in this Article 63 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 64, 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 the amounts described in 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 Article 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 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 the following, less salvage value:

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, if less than Direct Cost, 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 the amount described in 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 64 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.

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 the amounts described in 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 Materials Contracts or Items Based on Time and Material Records: On all **Contracts** or items in a **Contract** where payment for the **Work** is based on time and

material records, 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 64.2 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 Costs shall not include overhead.

64.3 In no event shall any payments under this Article 64 exceed the **Contract** price for such items.

64.4 All payments pursuant to Article 64 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 64, 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 64 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** 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 a 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 a 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 a 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 Federal 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 County of New York, upon request of the **City**, the **Contractor** shall either consent to a transfer of the action to a New York State Court of competent jurisdiction located in the **City** and County 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 New York State Court of competent jurisdiction in New York County.

65.3 If any provision(s) of this Article 65 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 Federal Export Administration Act of 1979, as amended, or the regulations of the United States Department of Commerce (Commerce Department) 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 for 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; however, compliance with this Article 67 is not required if the Agency sets Subcontractor Participation Goals for Minority- and Women-Owned Business Enterprises (M/WBEs).

67.2 Unless specifically waived by the **Commissioner** with the approval of the Division of Economic and Financial Opportunity of the City 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 enterprises (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 **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 LBEs 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 this **Contract**. Remedy for such breach may include the imposition of any or all of the following sanctions:

67.6.1 Reducing the **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 If the **Contractor** is an LBE, de-certifying and declaring the **Contractor** 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 contraction 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**, 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 69 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 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. ELECTRONIC FILING/NYC DEVELOPMENT HUB

70.1 The **Contractor** shall electronically file all alteration type-2 and alteration type-3 applications via the New York City Development Hub Web site, except applications for the following types of minor alterations: enlargements, curb cuts, legalizations, fire alarms, builders pavement plans, and jobs filed on Landmark Preservation Commission calendared properties. All such filings must be professionally certified. Information about electronic filing via the New York City Development Hub is available on the City Department of Buildings Web site at www.nyc.gov/buildings.

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 _____.

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: _____ Dollars, (\$ _____), 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.

ARTICLE 76. ELECTRONIC FUNDS TRANSFER

76.1 In accordance with Section 6-107.1 of the Administrative Code, the Contractor agrees to accept payments under this Contract from the City by electronic funds transfer (EFT). An EFT 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 Contract, the 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 the City Department of Finance with information necessary for the Contractor to receive electronic funds transfer payments through a 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 Contract. 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 Commissioner may waive the application of the requirements of this Article 76 to payments on contracts entered into pursuant to Section 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 Agency may waive the requirements of this Article 76 for payments in the following circumstances: (i) for individuals or classes of individuals for whom compliance imposes a hardship; (ii) for classifications of types of checks; or (iii) in other circumstances as may be necessary in the interest of the City.

ARTICLE 77. RECORDS RETENTION

77.1 The Contractor agrees to retain all books, records, and other documents relevant to this Contract for six years after the final payment or termination of this Contract, whichever is later. City, state, and federal auditors and any other persons duly authorized by the City shall have full access to and the right to examine any such books, records, and other documents during the retention period.

ARTICLE 78. 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 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) 391-1886. 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.

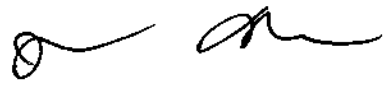
7. The Contractor's record in implementing its M/WBE Utilization Plan shall be a factor in the evaluation of its performance. Whenever Agency determines that a Contractor's compliance with an M/WBE Utilization Plan has been unsatisfactory, Agency shall, after consultation with the City Chief Procurement Officer, file an advice of caution form for inclusion in VENDEX as caution data.

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

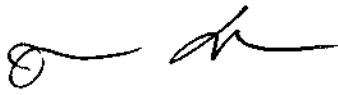
By: 
Associate Commissioner

CONTRACTOR: Ashnu International, Inc

By: 
(Member of Firm or Officer of Corporation)

Title: v. p.

(Where Contractor is a Corporation, add):
Attest:


Secretary

(Seal)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of New York County of Queens ss:

On this 27 day of JUNE, before me personally came NAYAN PADZIK
to me known, who, being by me duly sworn did depose and say that he resides at N.J.
that he is the V.P.

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.

VICTORIA AYO-VAUGHAN
Notary Public, State of New York
C. Registration #01AY5014042
Qualified in Queens County
Commission Expires July 15, 2019



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

ACKNOWLEDGMENT BY COMMISSIONER .

State of New York County of Queens ss:

On this 2th day of June, before me personally came Christine Flaherty 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, 2019

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

Four million six hundred fourteen thousand
one hundred fifteen dollars

Dollars (\$ 4,614,115.00)

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.



Associate 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

**MAYOR'S CERTIFICATE OR
CERTIFICATE OF THE DIRECTOR
OF THE BUDGET**

Performance Bond #1 (Pages 90 to 93): 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 #1 (Pages 90 to 93): 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, Ashru International, Inc.,
58-09 28th Avenue, Woodside, NY 11377

hereinafter referred to as the "Principal", and General Casualty Company of Wisconsin,
Wall Street Plaza, 88 Pine Street, New York, NY 10005

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

Four Million Six Hundred Fourteen Thousand One Hundred Fifteen
Dollars and 00/100

(\$ 4,614,115.00) 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 LBKA05RUG Renovation of the Rugby Branch Library, 1000 Utica Avenue,
Brooklyn, NY 11203 Contract No. 1 General Construction Work

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 #1 (Pages 90 to 93): 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.

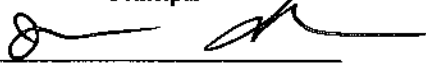
The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said 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 (Pages 90 to 93): 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.

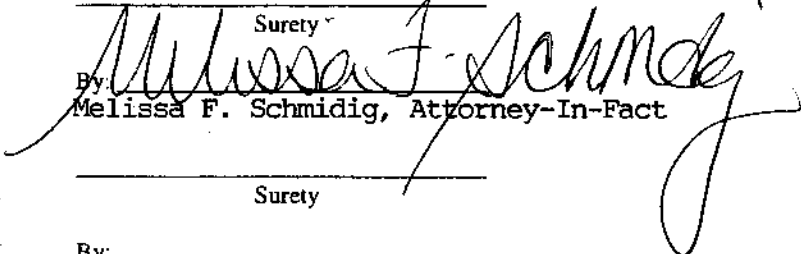
PERFORMANCE BOND #1 (Page 3)

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 23rd day of June, 2016.

(Seal) Ashnu International, Inc.

(L.S.)
Principal
By: 

(Seal) General Casualty Company of Wisconsin

Surety
By: 
Melissa F. Schmidig, Attorney-In-Fact

(Seal) _____
Surety
By: _____

(Seal) _____
Surety
By: _____

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.

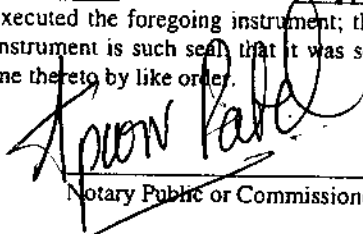
Performance Bond #1 (Pages 90 to 93): Use if the total contract price is \$5 Million Or Less. Performance Bond #1 has been approved by the U.S. Small Business Administration ("SBA") for participation in its Bond Guarantee Program.

PERFORMANCE BOND #1 (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of New York County of Queens ss:

On this 27th day of JUNE, 2016, before me personally came NAYAN PARIKH to me known, who, being by me duly sworn did depose and say that he resides at 36 Stokes Lane (Colonia NJ 07067) that he is the Vice President 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

APURV PATEL
Notary Public, State of New York
No. 01PAS016185
Qualified in Queens County
Commission Expires Sept. 14, 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

1. The first part of the document
 2. The second part of the document
 3. The third part of the document
 4. The fourth part of the document
 5. The fifth part of the document

ACKNOWLEDGEMENT OF SURETY

STATE OF: New Jersey

COUNTY OF: Bergen

On this 23rd day of June, 2016, before me personally appeared, Melissa F. Schmidig known to be the Attorney-In-Fact of General Casualty Company of Wisconsin, the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.



Notary Public in the State of New Jersey
County of Bergen

DONNA BORNEMANN
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Feb. 22, 2020

NEW JERSEY SURETY DISCLOSURE STATEMENT AND CERTIFICATION

GENERAL CASUALTY COMPANY OF WISCONSIN, surety on the attached bond, hereby certifies the following:

- (1) The surety meets the applicable capital and surplus requirements of R.S.17:17-6 or R.S.17:17-7 as of the surety's most current annual filing with the New Jersey Department of Insurance.
- (2) The capital and surplus, as determined in accordance with the applicable laws of this State, of the surety participating in the issuance of the attached bond is in the following amount as of the calendar year ended December 31, 2015, which amount has been certified as indicated by the certified public accountant, PriceWaterhouseCoopers LLP, New York, NY:

GENERAL CASUALTY COMPANY OF WISCONSIN

\$317,878,065

- (3) (a) With respect to each surety participating in the issuance of the attached bond that has received from the United States Secretary of the Treasury a certificate of authority pursuant to 31 U.S.C. 9305, the underwriting limitation established therein on July 1, 2015 is as follows:

GENERAL CASUALTY COMPANY OF WISCONSIN

\$23,871,000

- (b) With respect to each surety participating in the issuance of the attached bond that has not received such a certificate of authority from the United States Secretary of the Treasury, the underwriting limitation of that surety as established pursuant to R.S.17:18-9 as of December 31, 2015 is as follows: **Not applicable.**
- (4) The amount of the bond to which this statement and certification is attached is \$ 4,614,115.00.
- (5) If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in items (3)(a) or (3)(b) above, then for each such contract of reinsurance: **Not applicable.**
 - (a) The name and address of each such reinsurer under that contract and the amount of that reinsurer's participation in the contract is as follows: **Not applicable.**
 - (b) Each surety that is party to any such contract of reinsurance certifies that each reinsurer listed under item (5)(a) satisfies the credit for reinsurance requirement established under P.L. 1993, c.243 (C.17:51B-1 et seq.) and any applicable regulations in effect as of the date on which the bond to which this statement and certification is attached shall have been filed with the appropriate public agency.

CERTIFICATE

I, Brett Halsey, as Senior Vice President for GENERAL CASUALTY COMPANY OF WISCONSIN, a corporation admitted in New Jersey, DO HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements are false, this bond is VOIDABLE.



Brett Halsey
Senior Vice President

GENERAL CASUALTY COMPANY OF WISCONSIN

Statement of Admitted Assets, Liabilities and Capital and Surplus

As of December 31, 2015

(In thousands)

**As of
Dec 31, 2015**

ADMITTED ASSETS

Cash and invested assets	\$ 382,325
Agents' balances and uncollected premiums, net of commission and balances over 90 days past due	77,678
Reinsurance recoverable on paid losses and loss adjustment expenses	34,119
Net deferred tax asset	27,395
Investment Income due and accrued	572
Receivables from parent, subsidiaries and affiliates	117,069
Other assets	56,590
TOTAL ADMITTED ASSETS	\$ 695,748

LIABILITIES AND CAPITAL AND SURPLUS

Liabilities

Reserves for losses and loss adjustment expenses	\$ 202,431
Unearned premiums	68,431
Reinsurance payable on paid loss and loss adjustment expenses	2,479
Ceded reinsurance premiums payable, net of commissions	46,484
Other expenses	672
Commissions payable	19,315
Taxes, licenses and fees	1,560
Remittances and items not allocated	6,589
Provision for reinsurance	1,674
Retroactive reinsurance	(943)
Amounts withheld or retained for account of others	3,915
Payable from parent, subsidiaries and affiliates	43,421
Other liabilities	(18,158)
Total Liabilities	\$ 377,870

Capital and Surplus

Common stock	\$ 4,000
Gross paid in and contributed surplus	277,978
Special surplus funds	943
Unassigned funds (deficit)	54,859
Treasury stock, at cost	(19,902)
Total capital and surplus	\$ 317,878

Total liabilities and capital and surplus

\$
695,748

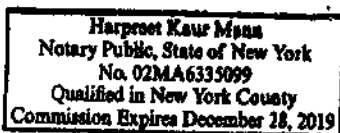
I, Brett Halsey, Senior Vice President of General Casualty Company of Wisconsin hereby certify that the above is an accurate representation of the financial statement of General Casualty Company of Wisconsin dated December 31, 2015, as filed with the various State Insurance Departments and is a true and correct statement of the condition of General Casualty Company of Wisconsin as of that date.

GENERAL CASUALTY COMPANY OF WISCONSIN

Brett Halsey
By: Brett Halsey, Senior Vice President

Subscribed and sworn to me this 15th day of March, 2016.

By: *Harpreet Mann*
Harpreet Mann, Notary Public



WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE BLUE BORDER

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS, that General Casualty Company of Wisconsin (the "Company"), a corporation duly organized and existing under the laws of the State of Wisconsin, having its principal office at 88 Pine Street, New York, NY 10005, has made, constituted and appointed, and does by these presents make, constitute and appoint Donna J. Bornemann, Paul Matrale, James V. Gardella, Melissa F. Schmidig, and Charles J. Cavadini of Professional Insurance Associates, Inc. of Caristadt, NJ its true and lawful Attorney-in-Fact, to sign its name as surety only as delineated below and to execute, seal, acknowledge and deliver any and all bonds and undertakings, with the exception of financial guaranty insurance, to the same extent as if such bonds had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office in their own proper persons.

This Power of Attorney shall be construed and enforced in accordance with, and governed by, the laws of the State of New York, without giving effect to the principles of conflict of laws. This Power of Attorney is granted pursuant to the following resolutions, which were duly and validly adopted at a meeting of the Board of Directors of the Company with effect from June 30, 2014:

RESOLVED, that the Chief Executive Officer, any President, any Executive Vice President, any Senior Vice President, any Vice President, the Corporate Secretary or any Assistant Corporate Secretary is authorized to appoint one or more Attorneys-in-Fact and agents to execute on behalf of the Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof, to prescribe their respective duties and the respective limits of their authority; and to revoke any such appointment at any time;

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking will be valid and binding upon the Company when (a) signed by any of the aforesaid authorized officers; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and agents pursuant to the power prescribed in his/her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and

FURTHER RESOLVED, that the signature of any authorized officer and the seal of the Company may be drawn on or affixed by facsimile or electronically transmitted by email to any power of attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, recognizance, or other suretyship obligation of the Company, and such signature and seal when so used shall have the same force and effect as though manually affixed. The Company may continue to use for the purposes herein stated the facsimile or electronically reproduced signature of any person or persons who shall have been such officer or officers of the Company, notwithstanding the fact that they may have ceased to be such at the time when such instruments shall be issued.

IN WITNESS WHEREOF, the Company has caused these presents to be signed and attested by its appropriate officers and its corporate seal hereunto affixed this December 22, 2015.

Attest:

GENERAL CASUALTY COMPANY OF WISCONSIN

(Seal)

By:

Brett Halsey
Brett Halsey
Senior Vice President

By:

Matt
Matt Curran
Senior Vice President

STATE OF NEW YORK)
)SS.:
COUNTY OF NEW YORK)

On this December 22, 2015, before me personally appeared Brett Halsey and Matt Curran, both to me known to be Senior Vice Presidents of General Casualty Company of Wisconsin, and that each, as such, being authorized to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporation by each as a duly authorized officer.

CAROL ROSENSTEEL

NOTARY PUBLIC-STATE OF NEW YORK
No. 01RO6238531

By:

Carol Rosensteel
Carol Rosensteel, Notary Public

Qualified in New York County

My Commission Expires April 18, 2019

CERTIFICATE

I, Jose Ramon Gonzalez, Jr., the undersigned, Corporate Secretary of General Casualty Company of Wisconsin do hereby certify that the foregoing is a true, correct and complete copy of the original Power of Attorney; that said Power of Attorney has not been revoked or rescinded and that the authority of the Attorney-in-Fact set forth herein, who executed the bond or undertaking to which this Power of Attorney is attached, is in full force and effect as of this date.

Given under my hand and seal of the Company, this 23rd day of June 2016.

(Seal)

By:

J. R. Gonzalez
Jose Ramon Gonzalez, Jr., Corporate Secretary

**CERTIFICATE OF SOLVENCY UNDER SECTION 1111 OF THE NEW
YORK INSURANCE LAW**

STATE OF NEW YORK

DEPARTMENT OF FINANCIAL SERVICES

It is hereby certified that

GENERAL CASUALTY COMPANY OF WISCONSIN

Of, Sun Prairie, Wisconsin

a corporation organized under the laws of the State of Wisconsin and duly authorized to transact the business of insurance in this State, is qualified to become surety or guarantor on all bonds, undertakings, recognizances, guaranties and other obligations required or permitted by law; and that the said corporation is possessed of a capital and surplus including gross paid-in and contributed surplus and unassigned funds (surplus) aggregating the sum of \$317,878,065 (Capital \$4,000,000) as is shown by its sworn financial statement for the year ending December 31, 2015 on file in this Department, prior to audit.

The said corporation cannot lawfully expose itself to loss on any one risk or hazard to an amount exceeding 10% of its surplus to policyholders, unless it shall be protected in excess of that amount in the manner provided in Section 4118 of the Insurance Law of this State.



In Witness Whereof, I have
unto set my hand and affixed
official seal of this Department
in the City of Albany, this
1st day of April, 2016.

Maria T. Vullo
Acting Superintendent

By
Jacqueline Catalfamo
Jacqueline Catalfamo
Special Deputy Superintendent

Payment Bond (Pages 98 to 101): 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, Ashnu International, Inc.,
58-09 28th Avenue, Woodside, NY 11377

hereinafter referred to as the "Principal", and General Casualty Company of Wisconsin
Wall Street Plaza, 88 Pine Street, New York, NY 10005

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

Four Million Six Hundred Fourteen Thousand One Hundred Fifteen Dollars
and 00/100

4,614,115.00

(\$_____ 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

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 98 to 101): 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.

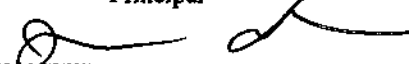
And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the 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 98 to 101): 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 23rd day of June, 2016.

(Seal) Ashnu International, Inc.
_____(L.S.)
Principal

By: 

(Seal) General Casualty Company of Wisconsin

Surety

By: 
Melissa F. Schmidig, Attorney-In-Fact

(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 98 to 101): Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 4)

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of New York County of Queens ss:

On this 27th day of JUNE, 2016 before me personally came Nayan Patel to me known, who, being by me duly sworn did depose and say that he resides at 36 Stokes Lane Colonia, NJ, 07067 that he is the Vice President 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.

[Signature]
Notary Public or Commissioner of Deeds

APURV PATEL
Notary Public, State of New York
No. 01PA5016185
Qualified in Queens County
Commission Expires Sept. 14, 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

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

ACKNOWLEDGEMENT OF SURETY

STATE OF: New Jersey

COUNTY OF: Bergen

On this 23rd day of June, 2016, before me personally appeared, Melissa F. Schmidig known to be the Attorney-In-Fact of General Casualty Company of Wisconsin, the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.



Notary Public in the State of New Jersey
County of Bergen

DONNA BORNEMANN
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Feb. 22, 2020

GENERAL CASUALTY COMPANY OF WISCONSIN

Statement of Admitted Assets, Liabilities and Capital and Surplus

As of December 31, 2015

(In thousands)

**As of
Dec 31, 2015****ADMITTED ASSETS**

| | | |
|---|----|----------------|
| Cash and invested assets | \$ | 382,325 |
| Agents' balances and uncollected premiums, net of commission and balances over 90 days past due | | 77,678 |
| Reinsurance recoverable on paid losses and loss adjustment expenses | | 34,119 |
| Net deferred tax asset | | 27,395 |
| Investment income due and accrued | | 572 |
| Receivables from parent, subsidiaries and affiliates | | 117,069 |
| Other assets | | 56,590 |
| TOTAL ADMITTED ASSETS | | \$ |
| | | 695,748 |

LIABILITIES AND CAPITAL AND SURPLUS**Liabilities**

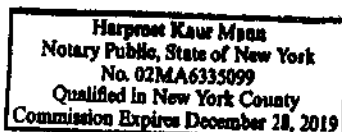
| | | |
|---|----|----------|
| Reserves for losses and loss adjustment expenses | \$ | 202,431 |
| Unearned premiums | | 88,431 |
| Reinsurance payable on paid loss and loss adjustment expenses | | 2,479 |
| Ceded reinsurance premiums payable, net of commissions | | 46,484 |
| Other expenses | | 672 |
| Commissions payable | | 19,315 |
| Taxes, licenses and fees | | 1,560 |
| Remittances and items not allocated | | 6,589 |
| Provision for reinsurance | | 1,674 |
| Retroactive reinsurance | | (943) |
| Amounts withheld or retained for account of others | | 3,915 |
| Payable from parent, subsidiaries and affiliates | | 43,421 |
| Other liabilities | | (18,158) |

Total Liabilities**\$
377,870****Capital and Surplus**

| | | |
|---------------------------------------|----|----------|
| Common stock | \$ | 4,000 |
| Gross paid in and contributed surplus | | 277,978 |
| Special surplus funds | | 943 |
| Unassigned funds (deficit) | | 54,859 |
| Treasury stock, at cost | | (19,902) |

Total capital and surplus**\$
317,878****Total liabilities and capital and surplus****\$
695,748**

I, Brett Halsey, Senior Vice President of General Casualty Company of Wisconsin hereby certify that the above is an accurate representation of the financial statement of General Casualty Company of Wisconsin dated December 31, 2015, as filed with the various State Insurance Departments and is a true and correct statement of the condition of General Casualty Company of Wisconsin as of that date.

GENERAL CASUALTY COMPANY OF WISCONSINBy: Brett Halsey
Brett Halsey, Senior Vice PresidentSubscribed and sworn to me this 15th day of March, 2016.By: Harpreet Mann
Harpreet Kaur Mann, Notary Public

**CERTIFICATE OF SOLVENCY UNDER SECTION 1111 OF THE NEW
YORK INSURANCE LAW**

STATE OF NEW YORK
DEPARTMENT OF FINANCIAL SERVICES

It is hereby certified that

GENERAL CASUALTY COMPANY OF WISCONSIN

Of, Sun Prairie, Wisconsin

a corporation organized under the laws of the State of Wisconsin and duly authorized to transact the business of insurance in this State, is qualified to become surety or guarantor on all bonds, undertakings, recognizances, guaranties and other obligations required or permitted by law; and that the said corporation is possessed of a capital and surplus including gross paid-in and contributed surplus and unassigned funds (surplus) aggregating the sum of \$317,878,065(Capital \$4,000,000) as is shown by its sworn financial statement for the year ending December 31, 2015 on file in this Department, prior to audit.

The said corporation cannot lawfully expose itself to loss on any one risk or hazard to an amount exceeding 10% of its surplus to policyholders, unless it shall be protected in excess of that amount in the manner provided in Section 4118 of the Insurance Law of this State.



In Witness Whereof, I have
unto set my hand and affixed
official seal of this Department
in the City of Albany, this
1st day of April, 2016.

Maria T. Vullo
Acting Superintendent

By
Jacqueline Catalfamo
Jacqueline Catalfamo
Special Deputy Superintendent



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

6/23/2016

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an **ADDITIONAL INSURED**, the policy(ies) must be endorsed. If **SUBROGATION IS WAIVED**, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

| | | |
|---|---|--------------------------------------|
| PRODUCER
Trivedi Capacity Associates
One International Blvd.
3rd Floor
Mahwah NJ 07495 | CONTACT NAME: Amar Dedhia
PHONE (A/C, No, Ext): (201) 661-2000
E-MAIL ADDRESS: adedhia@tcacoverage.com | FAX (A/C, No): (201) 661-7383 |
| | INSURER(S) AFFORDING COVERAGE | |
| INSURED
Ashnu International Inc
58-09 28th Ave.
Woodside NY 11377 | INSURER A: State National Insurance Co | NAIC # 12831 |
| | INSURER B: Navigators Ins co | NAIC # 42307 |
| | INSURER C: Ace American Insurance Co | NAIC # 22667 |
| | INSURER D: | |
| | INSURER E: | |
| | INSURER F: | |

COVERAGES **CERTIFICATE NUMBER:** CL163801527 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

| INSR LTR | TYPE OF INSURANCE | ADDL SUBR INSD WVD | POLICY NUMBER | POLICY EFF (MM/DD/YYYY) | POLICY EXP (MM/DD/YYYY) | LIMITS |
|----------|---|--------------------|------------------|-------------------------|-------------------------|--|
| A | <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY
<input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR
GEN'L AGGREGATE LIMIT APPLIES PER:
<input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC
OTHER: | X Y | CTM1600050 | 3/13/2016 | 3/13/2017 | EACH OCCURRENCE \$ 1,000,000
DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 50,000
MED EXP (Any one person) \$ 1,00,000
PERSONAL & ADV INJURY \$ 2,000,000
GENERAL AGGREGATE \$ 2,000,000
PRODUCTS - COMP/OP AGG \$ 10,000,000
Policy Aggregate \$ |
| | AUTOMOBILE LIABILITY
<input type="checkbox"/> ANY AUTO
<input type="checkbox"/> ALL OWNED AUTOS
<input type="checkbox"/> HIRED AUTOS
<input type="checkbox"/> SCHEDULED AUTOS
<input type="checkbox"/> NON-OWNED AUTOS | | | | | COMBINED SINGLE LIMIT (Ea accident) \$
BODILY INJURY (Per person) \$
BODILY INJURY (Per accident) \$
PROPERTY DAMAGE (Per accident) \$ |
| C | <input checked="" type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR
<input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE
<input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 10,000 | X Y | N10836311003 | 3/13/2016 | 3/13/2017 | EACH OCCURRENCE \$ 5,000,000
AGGREGATE \$ 5,000,000 |
| | WORKERS COMPENSATION AND EMPLOYERS' LIABILITY
ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)
If yes, describe under DESCRIPTION OF OPERATIONS below | Y/N N/A | | | | <input type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER
E.L. EACH ACCIDENT \$
E.L. DISEASE - EA EMPLOYEE \$
E.L. DISEASE - POLICY LIMIT \$ |
| B | Excess Umb Liability | X Y | NY16EXC866921 IV | 3/13/2016 | 3/13/2017 | \$5MM X 5MM Ace
Total -\$10MM |

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 Job Location: Renovation of the Rugby Branch Library.
 FMS ID # LBKA05RUG
 DDC Pin # 8502016LB0002C
 City Of New York its officials and employess. are included as Additional Insureds with respects to liability as required by written contract and to the extent provided by the actual policy language. Coverage is afforded on a primary and non-contributory basis with waiver of

| | |
|--|---|
| CERTIFICATE HOLDER
NYC- Department of design and Constructio
30-30 Thomson Avenue
Long Island City, NY 11101 | CANCELLATION
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
AUTHORIZED REPRESENTATIVE
Trivedi/AMAR |
|--|---|

COMMENTS/REMARKS

subrogation in favor of the additional insureds.



New York State Insurance Fund

Workers' Compensation & Disability Benefits Specialists Since 1914

199 CHURCH STREET, NEW YORK, N.Y. 10007-1100
Phone: (888) 997-3863

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

***** 113435601
ASHNU INTERNATIONAL INC
58-09 28TH AVE
WOODSIDE NY 11377



Scan to Validate

POLICYHOLDER
ASHNU INTERNATIONAL INC
58-09 28TH AVE
WOODSIDE NY 11377

CERTIFICATE HOLDER
ACCO'S OFFICE, INSURANCE UNIT
30-30 THOMSON AVENUE
4TH FLOOR
LONG ISLAND CITY NY 11101

| | | | |
|-------------------------------------|-------------------------------------|---|--------------------------|
| POLICY NUMBER
G1405 087-6 | CERTIFICATE NUMBER
504797 | PERIOD COVERED BY THIS CERTIFICATE
06/29/2015 TO 06/29/2017 | DATE
6/24/2016 |
|-------------------------------------|-------------------------------------|---|--------------------------|

THIS IS TO CERTIFY THAT THE POLICYHOLDER NAMED ABOVE IS INSURED WITH THE NEW YORK STATE INSURANCE FUND UNDER POLICY NO. 1405 087-6 UNTIL 06/29/2017, COVERING THE ENTIRE OBLIGATION OF THIS POLICYHOLDER FOR WORKERS' COMPENSATION UNDER THE NEW YORK WORKERS' COMPENSATION LAW WITH RESPECT TO ALL OPERATIONS IN THE STATE OF NEW YORK, EXCEPT AS INDICATED BELOW.

IF SAID POLICY IS CANCELLED, OR CHANGED PRIOR TO 06/29/2017 IN SUCH MANNER AS TO AFFECT THIS CERTIFICATE, 10 DAYS WRITTEN NOTICE OF SUCH CANCELLATION WILL BE GIVEN TO THE CERTIFICATE HOLDER ABOVE. NOTICE BY REGULAR MAIL SO ADDRESSED SHALL BE SUFFICIENT COMPLIANCE WITH THIS PROVISION. THE NEW YORK STATE INSURANCE FUND DOES NOT ASSUME ANY LIABILITY IN THE EVENT OF FAILURE TO GIVE SUCH NOTICE.

THIS POLICY DOES NOT COVER CLAIMS OR SUITS THAT ARISE FROM BODILY INJURY SUFFERED BY THE OFFICERS OF THE INSURED CORPORATION.

ASHA PARIKH, PRESIDENT
NAYAN PARIKH, VICE PRES
OF TWO PERSON CORP
ASHNU INTERNATIONAL INC

THIS CERTIFICATE DOES NOT APPLY TO THOSE JOB SITES WHICH ARE COVERED BY OTHER INSURANCE AND ARE SPECIFICALLY EXCLUDED BY ENDORSEMENT.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS NOR INSURANCE COVERAGE UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICY.

NEW YORK STATE INSURANCE FUND

DIRECTOR, INSURANCE FUND UNDERWRITING

This certificate can be validated on our web site at <https://www.nysif.com/cert/certval.asp> or by calling (888) 875-5790
VALIDATION NUMBER: 558335005

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART III. Certification by Insurance Broker or Agent

The undersigned insurance broker or agent represents to the City of New York that the attached Certificate of Insurance is accurate in all material respects.

Trivedi Capacity Associates, LLC

[Name of broker or agent (typewritten)]

One International Blvd, Mahwah, NJ, 07495

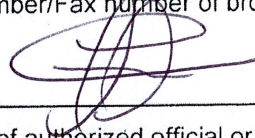
[Address of broker or agent (typewritten)]

Trivedi@tcacoverage.com

[Email address of broker or agent (typewritten)]

201-661-2411/FAX:- 201-661-7383

[Phone number/Fax number of broker or agent (typewritten)]



[Signature of authorized official or broker or agent]

Tushar Trivedi- President

[Name and title of authorized official, broker or agent (typewritten)]

State of NJ)
County of Bergen) ss:

Sworn to before me this

28th day of June, 2016

Karen Swistak
NOTARY PUBLIC FOR THE STATE OF NJ

KAREN SWISTAK
NOTARY PUBLIC OF NEW JERSEY
ID # 50011902
My Commission Expires 3/12/2020

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART IV. Address of Commissioner

Wherever reference is made in Article 7 or 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 below or, in the absence of such address, to the **Commissioner's** address as provided elsewhere in this **Contract**.

ACCO's Office, Insurance Unit

30-30 Thomson Avenue, 4th Floor

Long Island City, New York 11101

Performance Bond #1 (Pages 90 to 93): 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 (Pages 90 to 93): 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 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) _____ (L.S.)
Principal

By: _____

(Seal) _____
Surety

By: _____

(Seal) _____
Surety

By: _____

(Seal) _____
Surety

By: _____

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.

Performance Bond #1 (Pages 90 to 93): 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 94 to 97): 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;

Performance Bond #2 (Pages 94 to 97): Use if the total contract price is more than \$5 Million.

PERFORMANCE BOND #2 (Page2)

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 94 to 97): 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) _____ (L.S.)
Principal

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 98 to 101): 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 98 to 101): 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 98 to 101): 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 98 to 101): 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. 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.

This schedule is a compilation of separate determinations of the prevailing rate of wage and supplements made by the Comptroller for each trade classification listed herein pursuant to New York State Labor Law section 220 (5). The source of the wage and supplement rates, whether a collective bargaining agreement, survey data or other, is listed at the end of each classification.

Agency Chief Contracting Officers should contact the Bureau of Labor Law's Classification Unit with any questions concerning trade classifications, prevailing rates or prevailing practices with respect to procurement on New York City public works contracts. Contractors are advised to review the Comptroller's Prevailing Wage Schedule before bidding on public works contracts. Contractors with questions concerning trade classifications, prevailing rates or prevailing practices with respect to public works contracts in the procurement stage must contact the contracting agency responsible for the procurement.

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.

Any questions concerning trade classifications, prevailing rates or prevailing practices on New York City public works contracts that have already been awarded may be directed to the Bureau of Labor Law's Classification Unit by calling (212) 669-7974. All callers must have the agency name and contract registration number available when calling with questions on public works contracts. Please direct all other compliance issues to: Bureau of Labor Law, Attn: Wasył Kinach, P.E., Office of the Comptroller, 1 Centre Street, Room 1122, New York, N.Y. 10007; Fax (212) 669-4002.

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 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 worker, laborer, mechanic 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.

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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.

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.

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

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OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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ASBESTOS HANDLER

(Hazardous Material; Disturbs, removes, encapsulates, repairs, or encloses friable asbestos material)

Asbestos Handler

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$36.00

Supplemental Benefit Rate per Hour: \$15.95

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$46.89

Supplemental Benefit Rate per Hour: \$41.19

Blaster (Hydraulic)

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$47.71
Supplemental Benefit Rate per Hour: \$41.19

Blaster - Trac Drill Hydraulic

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$42.25
Supplemental Benefit Rate per Hour: \$41.19

Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$41.46
Supplemental Benefit Rate per Hour: \$41.19

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: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$40.42
Supplemental Benefit Rate per Hour: \$41.19

Blaster - Powder Carriers

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$36.53
Supplemental Benefit Rate per Hour: \$41.19

Blaster - Hydraulic Trac Drill Chuck Tender

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$35.25
Supplemental Benefit Rate per Hour: \$41.19

Blaster - Chuck Tender & Nipper

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$34.50
Supplemental Benefit Rate per Hour: \$41.19

Blaster - Magazine Keepers: (Watch Person)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$20.68
Supplemental Benefit Rate per Hour: \$41.19

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Overtime Description

Magazine Keepers:

Time and one half for work performed in excess of forty (40) hours per week and for work performed on Saturdays, Sundays and Holidays.

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$51.56

Supplemental Benefit Rate per Hour: \$41.69

Supplemental Note: For time and one half overtime - \$61.94 For double overtime - \$82.18

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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)

BRICKLAYER

Bricklayer

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$48.91

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$28.03

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$50.50

Supplemental Benefit Rate per Hour: \$45.88

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$50.50**

Supplemental Benefit Rate per Hour: **\$46.65**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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. The wage rate shall be 113% of the straight time hourly wage rate.

(Carpenters District Council)

CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST

Carpenter - Hod Hoist

(Assisted by Mason Tender)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$49.60

Supplemental Benefit Rate per Hour: \$43.00

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.

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

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

(Carpenters District Council)

CEMENT & CONCRETE WORKER

Cement & Concrete Worker

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$42.48**

Supplemental Benefit Rate per Hour: **\$26.57**

Supplemental Note: **\$29.32 on Saturdays; \$32.07 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)

CEMENT MASON

Cement Mason

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$38.88**

Supplemental Benefit Rate per Hour: **\$39.80**

Supplemental Note: For time and one half overtime - \$49.05; For double overtime - \$58.30

Overtime Description

Time and one-half the regular rate after an 8 hour day, double time the regular rate after 10 hours. Time and one-half the regular rate on Saturday, double time the regular rate after 10 hours. Double time the regular rate on 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.

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. Four Days a week at Ten (10)hour day.

(Local #780)

CORE DRILLER

Core Driller

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$36.82**

Supplemental Benefit Rate per Hour: **\$22.69**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Core Driller Helper

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$29.44**

Supplemental Benefit Rate per Hour: **\$22.69**

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$26.50**

Supplemental Benefit Rate per Hour: **\$22.69**

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$23.55**

Supplemental Benefit Rate per Hour: **\$22.69**

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$20.61**

Supplemental Benefit Rate per Hour: **\$22.69**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

(Carpenters District Council)

DERRICKPERSON AND RIGGER

Derrick Person & Rigger

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.84**

Supplemental Benefit Rate per Hour: **\$49.28**

Supplemental Note: The above supplemental rate applies for work performed in Manhattan, Bronx, Brooklyn and Queens. \$50.70 - For work performed in Staten Island.

Overtime Description

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$63.82**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$46.65

Diver Tender (Marine)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$45.47

Supplemental Benefit Rate per Hour: \$46.65

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$50.50

Supplemental Benefit Rate per Hour: \$46.65

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.

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 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate.

(Carpenters District Council)

DRIVER: TRUCK (TEAMSTER)

Driver - Dump Truck

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$39.53

Supplemental Benefit Rate per Hour: \$41.59

Supplemental Note: Over 40 hours worked: time and one half rate \$16.94, double time rate \$22.58

Driver - Tractor Trailer

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$39.50

Supplemental Benefit Rate per Hour: \$43.35

Supplemental Note: For over 40 hours worked: at time and one half - \$16.65; at double time - \$22.20

Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.06

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$43.35**

Supplemental Note: Over 40 hours worked: time and one half rate \$16.65 double time rate \$22.20

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

Shift Rates

Off single shift work commencing between 6:00 P.M. and 5:00 A.M. shall work eight and one half hours allowing for one half hour for lunch and receive 9 hours pay for 8 hours of work.

Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$36.30**

Supplemental Benefit Rate per Hour: **\$40.02**

Supplemental Note: Over 40 hours worked: time and one half rate \$13.90, double time rate \$18.53

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Overtime Description

For Paid Holidays: Employees working two (2) days in the calendar week in which the holiday falls are to be 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
Election Day
Thanksgiving Day
Christmas Day

(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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$54.00

Supplemental Benefit Rate per Hour: \$50.03

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Electrician "A" (Regular Day Overtime)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$81.00
Supplemental Benefit Rate per Hour: \$53.41

Electrician "A" (Day Shift)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$54.00
Supplemental Benefit Rate per Hour: \$50.03

Electrician "A" (Day Shift Overtime After 8 hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$81.00
Supplemental Benefit Rate per Hour: \$53.41

Electrician "A" (Swing Shift)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$63.36
Supplemental Benefit Rate per Hour: \$56.94

Electrician "A" (Swing Shift Overtime After 7.5 hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$95.04
Supplemental Benefit Rate per Hour: \$60.91

Electrician "A" (Graveyard Shift)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$70.97
Supplemental Benefit Rate per Hour: \$62.78

Electrician "A" (Graveyard Shift Overtime After 7 hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$106.46
Supplemental Benefit Rate per Hour: \$67.23

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 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. For three or less workers performing 8 hours temporary light and/or power the supplemental benefit rate is \$24.39.

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$27.50**

Supplemental Benefit Rate per Hour: **\$20.82**

First and Second Year "M" Wage Rate Per Hour: **\$23.00**

First and Second Year "M" Supplemental Rate: **\$18.56**

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$41.25**

Supplemental Benefit Rate per Hour: **\$22.54**

First and Second Year "M" Wage Rate Per Hour: **\$34.50**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

First and Second Year "M" Supplemental Rate: \$20.00

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)

Alarm Technician

Effective Period: 7/1/2015 - 3/9/2016
Wage Rate per Hour: \$31.40
Supplemental Benefit Rate per Hour: \$14.76
Supplemental Note: \$13.26 only after 8 hours worked in a day

Effective Period: 3/10/2016 - 6/30/2016
Wage Rate per Hour: \$32.00
Supplemental Benefit Rate per Hour: \$15.47
Supplemental Note: \$13.97 only after 8 hours worked in a day

Overtime Description

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

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. Up to 4 vacation days may be used as sick days.

(Local #3)

ELECTRICIAN-STREET LIGHTING WORKER

Electrician - Electro Pole Electrician

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$54.00

Supplemental Benefit Rate per Hour: \$51.86

Electrician - Electro Pole Foundation Installer

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$40.93**

Supplemental Benefit Rate per Hour: **\$39.46**

Electrician - Electro Pole Maintainer

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$35.05**

Supplemental Benefit Rate per Hour: **\$35.51**

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

(Local #3)

ELEVATOR CONSTRUCTOR

Elevator Constructor

Effective Period: 7/1/2015 - 3/16/2016

Wage Rate per Hour: **\$59.55**

Supplemental Benefit Rate per Hour: **\$31.07**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Effective Period: 3/17/2016 - 6/30/2016

Wage Rate per Hour: **\$60.96**

Supplemental Benefit Rate per Hour: **\$32.67**

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)

ELEVATOR REPAIR & MAINTENANCE

Elevator Service/Modernization Mechanic

Effective Period: 7/1/2015 - 3/16/2016

Wage Rate per Hour: **\$46.92**

Supplemental Benefit Rate per Hour: **\$30.91**

Effective Period: 3/17/2016 - 6/30/2016

Wage Rate per Hour: **\$47.91**

Supplemental Benefit Rate per Hour: **\$32.51**

Overtime Description

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

For Scheduled Service Work: Double time - work scheduled in advance by two or more workers 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

Afternoon shift - regularly hourly rate plus a (15%) fifteen percent differential. Graveyard shift - time and one half the regular rate.

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

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: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$64.31
Supplemental Benefit Rate per Hour: \$34.25
Supplemental Note: \$61.60 on overtime
Shift Wage Rate: \$102.90

Engineer - Heavy Construction Operating Engineer II

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Backhoes, Basin Machines, Groover, Mechanical Sweepers, Bobcat, Boom Truck, Barrier Transport (Barrier Tower) & 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, Cherrypickers. 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$62.40

Supplemental Benefit Rate per Hour: \$34.25

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: \$99.84

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$59.20

Supplemental Benefit Rate per Hour: \$34.25

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: \$94.72

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$62.11

Supplemental Benefit Rate per Hour: \$34.25

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: \$99.38

Engineer - Heavy Construction Maintenance Engineer II

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

On Base Mounted Tower Cranes

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$81.54**
Supplemental Benefit Rate per Hour: **\$34.25**
Supplemental Note: \$61.60 on overtime
Shift Wage Rate: **\$130.46**

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$41.04**
Supplemental Benefit Rate per Hour: **\$34.25**
Supplemental Note: \$61.60 on overtime
Shift Wage Rate: **\$65.66**

Engineer - Heavy Construction Maintenance Engineer IV

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$42.11**
Supplemental Benefit Rate per Hour: **\$34.25**
Supplemental Note: \$61.60 on overtime
Shift Wage Rate: **\$67.38**

Engineer - Heavy Construction Oilers I

Gradalls, Cold Planer Grader, Concrete Pumps, Driving Truck Cranes, Driving and Operating Fuel and Grease Trucks.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$56.02**
Supplemental Benefit Rate per Hour: **\$34.25**
Supplemental Note: \$61.60 on overtime
Shift Wage Rate: **\$89.63**

Engineer - Heavy Construction Oilers II

All gasoline, electric, diesel or air operated Shovels, Draglines, Backhoes, Keystones, Pavers, Guniting Machines, Battery of Compressors, Crawler Cranes, two-person Trenching Machines.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$38.79**
Supplemental Benefit Rate per Hour: **\$34.25**
Supplemental Note: \$61.60 on overtime
Shift Wage Rate: **\$62.06**

Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$59.77**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: **\$95.63**

Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$55.95**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: **\$89.52**

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$42.64**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

Shift Wage Rate: **\$68.22**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$56.88**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

Engineer - Building Work Maintenance Engineers II

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.22**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 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 Cranes: Driving and Operating Fuel and Grease Trucks, Cherrypickers (hydraulic cranes) over 70,000 GVW, and machines of a similar nature.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$54.08**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

Engineer - Building Work Oilers II

Oilers on Crawler Cranes, Backhoes, Trenching Machines, Gunite Machines, Compressors (three or more in Battery).

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$40.21**

Supplemental Benefit Rate per Hour: **\$34.25**

Supplemental Note: \$61.60 on overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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)

ENGINEER - CITY SURVEYOR AND CONSULTANT

Party Chief

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$37.04

Supplemental Benefit Rate per Hour: \$18.60

Supplemental Note: Overtime Benefit Rate - \$25.45 per hour (time & one half) \$32.30 per hour (double time).

Instrument Person

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$30.59

Supplemental Benefit Rate per Hour: \$18.60

Supplemental Note: Overtime Benefit Rate - \$25.45 per hour (time & one half) \$32.30 per hour (double time).

Rodperson

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$26.52**

Supplemental Benefit Rate per Hour: **\$18.60**

Supplemental Note: Overtime Benefit Rate - \$25.45 per hour (time & one half) \$32.30 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

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.)

Field Engineer - BC Party Chief

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$60.77**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime Benefit Rate - \$45.28 per hour (time & one half) \$58.15 per hour (double time).

Field Engineer - BC Instrument Person

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$47.20**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime Benefit Rate - \$45.28 per hour (time & one half) \$58.15 per hour (double time).

Field Engineer - BC Rodperson

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$30.49

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime Benefit Rate - \$45.28 per hour (time & one half) \$58.15 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

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$66.43

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$48.82

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 per hour (double time).

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§220 PREVAILING WAGE SCHEDULE

Field Engineer - HC Rodperson

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$40.99**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 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)

Field Engineer - Steel Erection Party Chief

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$62.26**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 per hour (double time).

Field Engineer - Steel Erection Instrument Person

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$48.57**

Supplemental Benefit Rate per Hour: **\$32.40**

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 per hour (double time).

Field Engineer - Steel Erection Rodperson

Effective Period: 7/1/2015 - 6/30/2016

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Wage Rate per Hour: \$32.61

Supplemental Benefit Rate per Hour: \$32.40

Supplemental Note: Overtime benefit rate - \$45.28 per hour (time & one half), \$58.15 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

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$71.75

Supplemental Benefit Rate per Hour: \$30.40

Supplemental Note: \$55.10 overtime hours

Shift Wage Rate: \$114.80

Operating Engineer - Road & Heavy Construction II

Backhoes, Power Shovels, Hydraulic Clam Shells, Steel Erection, Moles and machines of a similar nature.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$74.29

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Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: **\$55.10** overtime hours
Shift Wage Rate: **\$118.86**

Operating Engineer - Road & Heavy Construction III

Mine Hoists, Cranes, etc. (Used as Mine Hoists)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$76.67**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: **\$55.10** overtime hours
Shift Wage Rate: **\$122.67**

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: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$74.84**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: **\$55.10** overtime hours
Shift Wage Rate: **\$119.74**

Operating Engineer - Road & Heavy Construction V

Pile Drivers & Rigs (employing Dock Builder foreperson): Derrick Boats, Tunnel Shovels.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$73.36**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: **\$55.10** overtime hours
Shift Wage Rate: **\$117.38**

Operating Engineer - Road & Heavy Construction VI

Mixers (Concrete with loading attachment), Concrete Pavers, Cableways, Land Derricks, Power Houses (Low Air Pressure Units).

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$69.69**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: **\$55.10** overtime hours
Shift Wage Rate: **\$111.50**

Operating Engineer - Road & Heavy Construction VII

Barrier Movers , Barrier Transport and Machines of a Similar Nature.

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Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$56.25
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: \$90.00

Operating Engineer - Road & Heavy Construction VIII

Utility Compressors

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$43.63
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: \$55.03

Operating Engineer - Road & Heavy Construction IX

Horizontal Boring Rig

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$66.26
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: \$106.02

Operating Engineer - Road & Heavy Construction X

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$60.89
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: \$97.42

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: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$47.28
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: \$75.65

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

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Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$70.42**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: **\$112.67**

Operating Engineer - Road & Heavy Construction XIII

Concrete Pumps, Concrete Plant, Stone Crushers, Double Drum Hoist, Power Houses (other than above).

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$68.19**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: **\$109.10**

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$65.20**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: **\$104.32**

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: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$43.91**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: **\$70.26**

Operating Engineer - Road & Heavy Construction XVI

Concrete Breaking Machines, Hoists (Single Drum), Load Masters, Locomotives (over ten tons) and Dinkies over ten tons, Hydraulic Crane-Second Engineer.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: **\$62.25**
Supplemental Benefit Rate per Hour: **\$30.40**
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: **\$99.60**

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Operating Engineer - Road & Heavy Construction XVII

On-Site concrete plant engineer, On-site Asphalt Plant Engineer, and Vibratory console.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$62.74**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$100.38**

Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$90.09**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$144.14**

Operating Engineer - Paving I

Asphalt Spreaders, Autogrades (C.M.I.), Roto/Mil

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$69.69**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$111.50**

Operating Engineer - Paving II

Asphalt Roller

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$67.87**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$108.59**

Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$57.40**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: **\$55.10** overtime hours

Shift Wage Rate: **\$91.84**

Operating Engineer - Concrete I

Cranes

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$74.51

Supplemental Benefit Rate per Hour: \$30.40

Supplemental Note: \$55.10 overtime hours

Operating Engineer - Concrete II

Compressors

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$44.25

Supplemental Benefit Rate per Hour: \$30.40

Supplemental Note: \$55.10 overtime hours

Operating Engineer - Concrete III

Micro-traps (Negative Air Machines), Vac-All Remediation System.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$59.51

Supplemental Benefit Rate per Hour: \$30.40

Supplemental Note: \$55.10 overtime hours

Operating Engineer - Steel Erection I

Three Drum Derricks

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$77.40

Supplemental Benefit Rate per Hour: \$30.40

Supplemental Note: \$55.10 overtime hours

Shift Wage Rate: \$123.84

Operating Engineer - Steel Erection II

Cranes, 2 Drum Derricks, Hydraulic Cranes, Fork Lifts and Boom Trucks.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$74.37

Supplemental Benefit Rate per Hour: \$30.40

Supplemental Note: \$55.10 overtime hours

Shift Wage Rate: \$118.99

Operating Engineer - Steel Erection III

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Compressors, Welding Machines.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$44.09
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: \$70.54

Operating Engineer - Steel Erection IV

Compressors - Not Combined with Welding Machine.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$41.98
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours
Shift Wage Rate: \$67.17

Operating Engineer - Building Work I

Forklifts, Plaster (Platform machine), Plaster Bucket, Concrete Pump and all other equipment used for hoisting material.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$61.27
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours

Operating Engineer - Building Work II

Compressors, Welding Machines (Cutting Concrete-Tank Work), Paint Spraying, Sandblasting, Pumps (with the exclusion of Concrete Pumps), All Engines irrespective of Power (Power-Pac) used to drive Auxiliary Equipment, Air, Hydraulic, Jacking System, etc.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$45.85
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours

Operating Engineer - Building Work III

Double Drum

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$69.76
Supplemental Benefit Rate per Hour: \$30.40
Supplemental Note: \$55.10 overtime hours

Operating Engineer - Building Work IV

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Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$73.91**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$68.09**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$67.37**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

Operating Engineer - Building Work VII

Rack & Pinion and House Cars

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$53.54**

Supplemental Benefit Rate per Hour: **\$30.40**

Supplemental Note: \$55.10 overtime hours

For New House Car projects Wage Rate per Hour **\$42.70**

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

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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

For Steel Erection Only: 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$50.50

Supplemental Benefit Rate per Hour: \$45.88

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
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 10/31/2015

Wage Rate per Hour: **\$43.35**

Supplemental Benefit Rate per Hour: **\$36.59**

Supplemental Note: Supplemental Benefit Overtime Rate: **\$45.34**

Effective Period: 11/1/2015 - 6/30/2016

Wage Rate per Hour: **\$43.95**

Supplemental Benefit Rate per Hour: **\$36.84**

Supplemental Note: Supplemental Benefit Overtime Rate: **\$45.59**

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

Thanksgiving Day

Day after Thanksgiving

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$23.68**

Supplemental Benefit Rate per Hour: **\$19.54**

Overtime

Time and one half the regular rate after an 8 hour day.

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$57.38

Supplemental Benefit Rate per Hour: \$37.41

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)

HOUSE WRECKER (TOTAL DEMOLITION)

House Wrecker - Tier A

On all work sites the first, second, eleventh and every third House Wrecker thereafter will be Tier A House Wreckers (i.e. 1st, 2nd, 11th, 14th etc). Other House Wreckers may be Tier B House Wreckers.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$35.52**

Supplemental Benefit Rate per Hour: **\$26.86**

House Wrecker - Tier B

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$24.90**

Supplemental Benefit Rate per Hour: **\$19.88**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$43.20

Supplemental Benefit Rate per Hour: \$47.67

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$48.75

Supplemental Benefit Rate per Hour: \$67.34

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

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§220 PREVAILING WAGE SCHEDULE

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.
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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.50

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$36.53

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
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: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$27.00
Supplemental Benefit Rate per Hour: \$14.55

Landscaper (3 - 6 years experience)

Effective Period: 7/1/2015 - 6/30/2016

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§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$26.00
Supplemental Benefit Rate per Hour: \$14.55

Landscaper (up to 3 years experience)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$23.50
Supplemental Benefit Rate per Hour: \$14.55

Groundperson

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$23.50
Supplemental Benefit Rate per Hour: \$14.55

Tree Remover / Pruner

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$32.00
Supplemental Benefit Rate per Hour: \$14.55

Landscaper Sprayer (Pesticide Applicator)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$22.00
Supplemental Benefit Rate per Hour: \$14.55

Watering - Plant Maintainer

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$17.00
Supplemental Benefit Rate per Hour: \$14.55

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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)

MARBLE MECHANIC

Marble Setter

Effective Period: 7/1/2015 - 12/31/2015

Wage Rate per Hour: **\$51.53**

Supplemental Benefit Rate per Hour: **\$35.73**

Effective Period: 1/1/2016 - 6/30/2016

Wage Rate per Hour: **\$51.89**

Supplemental Benefit Rate per Hour: **\$36.62**

Marble Finisher

Effective Period: 7/1/2015 - 12/31/2015

Wage Rate per Hour: **\$40.53**

Supplemental Benefit Rate per Hour: **\$34.52**

Effective Period: 1/1/2016 - 6/30/2016

Wage Rate per Hour: **\$40.80**

Supplemental Benefit Rate per Hour: **\$35.15**

Marble Polisher

Effective Period: 7/1/2015 - 12/31/2015

Wage Rate per Hour: **\$36.65**

Supplemental Benefit Rate per Hour: **\$26.63**

Effective Period: 1/1/2016 - 6/30/2016

Wage Rate per Hour: **\$37.02**

Supplemental Benefit Rate per Hour: **\$27.01**

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.

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§220 PREVAILING WAGE SCHEDULE

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)

MASON TENDER

Mason Tender

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$36.67

Supplemental Benefit Rate per Hour: \$28.02

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

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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)

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$35.46**

Supplemental Benefit Rate per Hour: **\$22.13**

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$24.65**

Supplemental Benefit Rate per Hour: **\$16.45**

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

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§220 PREVAILING WAGE SCHEDULE

Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

(Local #79)

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$43.63

Supplemental Benefit Rate per Hour: \$41.57

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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)

MILLWRIGHT

Millwright

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$49.50**

Supplemental Benefit Rate per Hour: **\$52.01**

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$45.91**

Supplemental Benefit Rate per Hour: **\$38.15**

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of **\$48.92** per hour.

Mosaic Mechanic - Mosaic & Terrazzo Finisher

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.30**

Supplemental Benefit Rate per Hour: **\$38.14**

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of **\$48.91** per hour.

Mosaic Mechanic - Machine Operator Grinder

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.30**

Supplemental Benefit Rate per Hour: **\$38.14**

Supplemental Note: Supplemental benefits for overtime to be paid at the rate of **\$48.91** 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

Paid Holidays

None

(Local #7)

PAINTER

Painter - Brush & Roller

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$41.00**

Supplemental Benefit Rate per Hour: **\$26.37**

Supplemental Note: \$31.00 on overtime

Spray & Scaffold / Decorative / Sandblast

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$44.00**

Supplemental Benefit Rate per Hour: **\$26.37**

Supplemental Note: \$31.00 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.

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$40.30**

Supplemental Benefit Rate per Hour: **\$7.22**

Journey person

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$37.48**

Supplemental Benefit Rate per Hour: **\$7.22**

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

Martin Luther King Jr. Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Two (2) additional holidays as floating holidays

(Local #8A-28A)

PAINTER - STRIPER

Striper (paint)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$35.00**

Supplemental Benefit Rate per Hour: **\$12.27**

Supplemental Note: Overtime Supplemental Benefit rate - \$8.02 New Hire Rate (0-3 months) - \$0.00

Lineperson (thermoplastic)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$39.00**

Supplemental Benefit Rate per Hour: **\$12.27**

Supplemental Note: Overtime Supplemental Benefit rate - \$8.02; New Hire Rate (0-3 months) - \$0.00

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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.

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.

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: 7/1/2015 - 9/30/2015

Wage Rate per Hour: \$48.00

Supplemental Benefit Rate per Hour: \$34.58

Effective Period: 10/1/2015 - 6/30/2016

Wage Rate per Hour: \$49.00

Supplemental Benefit Rate per Hour: \$36.08

Painter - Power Tool

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 9/30/2015

Wage Rate per Hour: \$54.00

Supplemental Benefit Rate per Hour: \$34.58

Effective Period: 10/1/2015 - 6/30/2016

Wage Rate per Hour: \$55.00

Supplemental Benefit Rate per Hour: \$36.08

Overtime Description

Supplemental Benefits shall be paid for each hour worked, up to forty (40) hours per week for the period of May 1st to November 15th or up to fifty (50) hours per week for the period of November 16th to April 30th.

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$41.08

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.

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§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
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.

(District Council of Painters #9)

PAVER AND ROADBUILDER

Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$44.85

Supplemental Benefit Rate per Hour: \$36.92

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.98

Supplemental Benefit Rate per Hour: \$36.92

Production Paver & Roadbuilder - Screed Person

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§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$45.45

Supplemental Benefit Rate per Hour: \$36.92

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$44.85

Supplemental Benefit Rate per Hour: \$36.92

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$41.56

Supplemental Benefit Rate per Hour: \$36.92

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

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 the single time rate, except that production paving work shall be paid at 15% over the single time rate for the screed person, rakers and

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

shovelers directly involved only. All other workers will be exempt. 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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$43.43

Supplemental Benefit Rate per Hour: \$27.95

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 (½) hour to eat with this time being included in the seven (7) hours of work.

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§220 PREVAILING WAGE SCHEDULE

Local #530)

PLASTERER - TENDER

Plasterer - Tender

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$36.67**

Supplemental Benefit Rate per Hour: **\$28.02**

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: 7/1/2015 - 6/30/2016

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§220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$65.27**

Supplemental Benefit Rate per Hour: **\$28.38**

Supplemental Note: Overtime supplemental benefit rate per hour: **\$56.48**

Plumber - Temporary Services

Temporary Services - When there are no Plumbers on the job site, there may be three shifts designed to cover the entire twenty-four hour period, including weekends if necessary, at the following rate straight time.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: **\$52.24**

Supplemental Benefit Rate per Hour: **\$22.28**

Overtime Description

Double time the regular rate after a 7 hour day - unless for new construction site work where the plumbing contract price is \$1.5 million or less, the hours of labor can be 8 hours per day at the employers option. On Alteration jobs when other mechanical 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.)

Plumber

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$39.27

Supplemental Benefit Rate per Hour: \$13.34

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

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$45.19

Supplemental Benefit Rate per Hour: \$20.62

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

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§220 PREVAILING WAGE SCHEDULE

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.

(Plumbers Local #1)

PLUMBER: PUMP & TANK

Oil Trades (Installation and Maintenance)

Plumber - Pump & Tank

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$62.83

Supplemental Benefit Rate per Hour: \$21.37

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
Columbus Day
Veteran's Day
Thanksgiving Day

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§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$47.41

Supplemental Benefit Rate per Hour: \$24.40

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.

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§220 PREVAILING WAGE SCHEDULE

(Bricklayer District Council)

ROOFER

Roofer

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.70

Supplemental Benefit Rate per Hour: \$30.17

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: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$47.41

Supplemental Benefit Rate per Hour: \$24.40

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)

SHEET METAL WORKER

Sheet Metal Worker

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$46.96

Supplemental Benefit Rate per Hour: \$45.19

Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$37.57

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
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Supplemental Benefit Rate per Hour: \$45.19

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$12.90

Supplemental Benefit Rate per Hour: \$8.07

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.

(Local #28)

SHEET METAL WORKER - SPECIALTY
(Decking & Siding)

Sheet Metal Specialty Worker

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
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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.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$42.64

Supplemental Benefit Rate per Hour: \$23.62

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)

SHIPYARD WORKER

Shipyard Mechanic - First Class

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.54

Supplemental Benefit Rate per Hour: \$3.01

Shipyard Mechanic - Second Class

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$20.22

Supplemental Benefit Rate per Hour: \$2.73

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Shipyard Laborer - First Class

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$20.90
Supplemental Benefit Rate per Hour: \$2.75

Shipyard Laborer - Second Class

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$13.86
Supplemental Benefit Rate per Hour: \$2.48

Shipyard Dockhand - First Class

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$23.61
Supplemental Benefit Rate per Hour: \$2.86

Shipyard Dockhand - Second Class

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$15.94
Supplemental Benefit Rate per Hour: \$2.56

Overtime Description

Work performed on holiday is paid double time the regular hourly wage rate plus holiday pay.

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 hourly rate after 40 hours in any work week.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Based on Survey Data

SIGN ERECTOR (Sheet Metal, Plastic, Electric, and Neon)

Sign Erector

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$45.60

Supplemental Benefit Rate per Hour: \$46.28

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$55.00

Supplemental Benefit Rate per Hour: \$52.79

Supplemental Note: Overtime supplemental benefit rate: \$104.84

Steamfitter -Temporary Services

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

The steamfitters shall not do any other work and shall not be permitted to work more than one shift in a twenty-four hour day. When steamfitters are present during the regular working day, no temporary services steamfitter will be required

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$41.80

Supplemental Benefit Rate per Hour: \$42.76

Supplemental Note: .

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

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$55.00

Supplemental Benefit Rate per Hour: \$52.79

Supplemental Note: Overtime supplemental benefit rate: \$104.84

Steamfitter -Temporary Services

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

The steamfitters shall not do any other work and shall not be permitted to work more than one shift in a twenty-four hour day. When steamfitters are present during the regular working day, no temporary services steamfitter will be required.

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$41.80

Supplemental Benefit Rate per Hour: \$42.76

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

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
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Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$39.25
Supplemental Benefit Rate per Hour: \$13.81

Refrigeration and Air Conditioner Service Person V

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$32.25
Supplemental Benefit Rate per Hour: \$12.44

Refrigeration and Air Conditioner Service Person IV

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$26.72
Supplemental Benefit Rate per Hour: \$11.30

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.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$22.93
Supplemental Benefit Rate per Hour: \$10.45

Refrigeration and Air Conditioner Service Person II

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$19.02
Supplemental Benefit Rate per Hour: \$9.67

Refrigeration and Air Conditioner Service Person I

Filter changing and maintenance thereof, oil and greasing, tower and coil cleaning, scraping and painting, general housekeeping, taking of water samples.

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$13.91
Supplemental Benefit Rate per Hour: \$8.78

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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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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$47.20

Supplemental Benefit Rate per Hour: \$37.15

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

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§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 12/29/2015

Wage Rate per Hour: **\$46.32**

Supplemental Benefit Rate per Hour: **\$22.66**

Effective Period: 12/30/2015 - 6/30/2016

Wage Rate per Hour: **\$46.82**

Supplemental Benefit Rate per Hour: **\$22.66**

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.35

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$40.03

Supplemental Benefit Rate per Hour: \$29.71

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

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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: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$51.61

Supplemental Benefit Rate per Hour: \$33.46

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)

TIMBERPERSON

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Timberperson

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$45.60

Supplemental Benefit Rate per Hour: \$46.67

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.

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. The wage rate shall be 113% of the straight time hourly wage rate.

(Local #1536)

TUNNEL WORKER

Blasters, Mucking Machine Operators (Compressed Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$59.17

Supplemental Benefit Rate per Hour: \$49.45

Tunnel Workers (Compressed Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 PREVAILING WAGE SCHEDULE

Wage Rate per Hour: \$57.12

Supplemental Benefit Rate per Hour: \$47.80

Top Nipper (Compressed Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$56.07

Supplemental Benefit Rate per Hour: \$46.96

Outside Lock Tender, Outside Gauge Tender, Muck Lock Tender (Compressed Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$55.06

Supplemental Benefit Rate per Hour: \$46.07

Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$55.06

Supplemental Benefit Rate per Hour: \$46.07

Changehouse Attendant: Powder Watchperson (Compressed Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$48.16

Supplemental Benefit Rate per Hour: \$43.62

Blasters (Free Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$56.47

Supplemental Benefit Rate per Hour: \$47.47

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$54.04

Supplemental Benefit Rate per Hour: \$45.45

All Others (Free Air Rates)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$49.93

Supplemental Benefit Rate per Hour: \$42.06

Microtunneling (Free Air Rates)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$43.23

Supplemental Benefit Rate per Hour: \$36.36

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 JOURNEYPERSON 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.

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ASBESTOS HANDLER

(Ratio of Apprentice Journeyperson: 1 to 1, 1 to 3)

Asbestos Handler (First 1000 Hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 78% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$15.95

Asbestos Handler (Second 1000 Hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$15.95

Asbestos Handler (Third 1000 Hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 83% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$15.95

Asbestos Handler (Fourth 1000 Hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 89% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$15.95

(Local #78)

BOILERMAKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$30.00

Boilermaker (Second Year: 1st Six Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 70% of Journeyperson's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate Per Hour: \$31.66

Boilermaker (Second Year: 2nd Six Months)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 75% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$33.32

Boilermaker (Third Year: 1st Six Months)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$35.00

Boilermaker (Third Year: 2nd Six Months)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 85% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$36.67

Boilermaker (Fourth Year: 1st Six Months)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 90% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$38.34

Boilermaker (Fourth Year: 2nd Six Months)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 95% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$40.01

(Local #5)

BRICKLAYER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Bricklayer (First 750 Hours)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$17.10

Bricklayer (Second 750 Hours)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$17.10

Bricklayer (Third 750 Hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 70% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$17.10

Bricklayer (Fourth 750 Hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$17.10

Bricklayer (Fifth 750 Hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 90% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$17.10

Bricklayer (Sixth 750 Hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 95% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$17.10

(Bricklayer District Council)

CARPENTER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Carpenter (First Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 40% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$31.14

Carpenter (Second Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$31.14

Carpenter (Third Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$31.14

Carpenter (Fourth Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: \$31.14

(Carpenters District Council)

CEMENT MASON

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cement Mason (First Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's Rate

Cement Mason (Second Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's Rate

Cement Mason (Third Year)

Effective Period: 7/1/2015 - 6/30/2016
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 (First 1333 hours)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$18.84

Cement & Concrete Worker (Second 1333 hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 65% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$24.65

Cement & Concrete Worker (Last 1334 hours)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$25.47

(Cement Concrete Workers District Council)

DERRICKPERSON & RIGGER (STONE)
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Derrickperson & Rigger (stone) - First Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Benefit Rate Per Hour: 50% of Journeyman's rate

Derrickperson & Rigger (stone) - Second Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 70% of Journeyman's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyman's rate

Derrickperson & Rigger (stone) - Second Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyman's rate

Derrickperson & Rigger (stone) - Third Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 90% of Journeyman's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyman's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

(Local #197)

DOCKBUILDER/PILE DRIVER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 6)

Dockbuilder/Pile Driver (First Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$31.52

Dockbuilder/Pile Driver (Second Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$31.52

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 65% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$31.52

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$31.52

(Carpenters District Council)

ELECTRICIAN

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Electrician (First Term: 0-6 Months)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$13.00

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$11.61
Overtime Supplemental Rate Per Hour: \$12.47

Electrician (First Term: 7-12 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$14.00
Supplemental Benefit Rate per Hour: \$12.12
Overtime Supplemental Rate Per Hour: \$13.04

Electrician (Second Term: 0-6 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$15.00
Supplemental Benefit Rate per Hour: \$12.63
Overtime Supplemental Rate Per Hour: \$13.62

Electrician (Second Term: 7-12 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$16.00
Supplemental Benefit Rate per Hour: \$13.14
Overtime Supplemental Rate Per Hour: \$14.19

Electrician (Third Term: 0-6 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$17.00
Supplemental Benefit Rate per Hour: \$13.65
Overtime Supplemental Rate Per Hour: \$14.77

Electrician (Third Term: 7-12 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$18.00
Supplemental Benefit Rate per Hour: \$14.16
Overtime Supplemental Rate Per Hour: \$15.34

Electrician (Fourth Term: 0-6 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$19.00
Supplemental Benefit Rate per Hour: \$14.67
Overtime Supplemental Rate Per Hour: \$15.92

Electrician (Fourth Term: 7-12 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$21.00

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$15.68
Overtime Supplemental Rate Per Hour: \$17.07

Electrician (Fifth Term: 0-12 Months - Hired on or after 5/10/07)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$23.00
Supplemental Benefit Rate per Hour: \$18.56
Overtime Supplemental Rate Per Hour: \$20.00

Electrician (Fifth Term: 13-18 Months - Hired on or after 5/10/07)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$27.50
Supplemental Benefit Rate per Hour: \$20.82
Overtime Supplemental Rate Per Hour: \$22.54

Electrician (Fifth Term: 0-18 Months - Hired before 5/10/07)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$26.80
Supplemental Benefit Rate per Hour: \$20.46
Overtime Supplemental Rate Per Hour: \$22.14

Overtime Description

Overtime Wage paid at time and one half the regular rate
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 Journeyman: 1 to 1, 1 to 2)

Elevator (Constructor) - First Year

Effective Period: 7/1/2015 - 3/16/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$26.94

Effective Period: 3/17/2016 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$28.41

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Elevator (Constructor) - Second Year

Effective Period: 7/1/2015 - 3/16/2016
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$27.35

Effective Period: 3/17/2016 - 6/30/2016
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$28.84

Elevator (Constructor) - Third Year

Effective Period: 7/1/2015 - 3/16/2016
Wage Rate Per Hour: 65% of Journeyman's rate
Supplemental Rate Per Hour: \$28.17

Effective Period: 3/17/2016 - 6/30/2016
Wage Rate Per Hour: 65% of Journeyman's rate
Supplemental Rate Per Hour: \$29.69

Elevator (Constructor) - Fourth Year

Effective Period: 7/1/2015 - 3/16/2016
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Rate Per Hour: \$29.00

Effective Period: 3/17/2016 - 6/30/2016
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Rate Per Hour: \$30.54

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 2)

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2015 - 3/16/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Benefit Per Hour: \$26.87

Effective Period: 3/17/2016 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Benefit Per Hour: \$28.34

Elevator Service/Modernization Mechanic (Second Year)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 3/16/2016
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Benefit Per Hour: \$27.27

Effective Period: 3/17/2016 - 6/30/2016
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Benefit Per Hour: \$28.76

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2015 - 3/16/2016
Wage Rate Per Hour: 65% of Journeyman's rate
Supplemental Benefit Per Hour: \$28.08

Effective Period: 3/17/2016 - 6/30/2016
Wage Rate Per Hour: 65% of Journeyman's rate
Supplemental Benefit Per Hour: \$29.60

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2015 - 3/16/2016
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Benefit Per Hour: \$28.89

Effective Period: 3/17/2016 - 6/30/2016
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Benefit Per Hour: \$30.43

(Local #1)

ENGINEER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 5)

Engineer - First Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$23.68
Supplemental Benefit Rate per Hour: \$22.55

Engineer - Second Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$29.60
Supplemental Benefit Rate per Hour: \$22.55

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Engineer - Third Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$32.56
Supplemental Benefit Rate per Hour: \$22.55

Engineer - Fourth Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$35.52
Supplemental Benefit Rate per Hour: \$22.55

(Local #15)

ENGINEER - OPERATING

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Operating Engineer - First Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour 40% of Journeyperson's Rate
Supplemental Benefit Per Hour: \$20.15

Operating Engineer - Second Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyperson's Rate
Supplemental Benefit Per Hour: \$20.15

Operating Engineer - Third Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 60% of Journeyperson's Rate
Supplemental Benefit Per Hour: \$20.15

(Local #14)

FLOOR COVERER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 40% of Journeyman's rate
Supplemental Rate Per Hour: \$31.14

Floor Coverer (Second Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$31.14

Floor Coverer (Third Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 65% of Journeyman's rate
Supplemental Rate Per Hour: \$31.14

Floor Coverer (Fourth Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Rate Per Hour: \$31.14

(Carpenters District Council)

GLAZIER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Glazier (First Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 40% of Journeyman's rate
Supplemental Rate Per Hour: \$13.64
Effective 11/1/2015 - Supplemental Rate Per Hour: \$13.79

Glazier (Second Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Rate Per Hour: \$22.97
Effective 11/1/2015 - Supplemental Rate Per Hour: \$23.13

Glazier (Third Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Rate Per Hour: \$25.87
Effective 11/1/2015 - Supplemental Rate Per Hour: \$26.03

Glazier (Fourth Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Rate Per Hour: \$31.04
Effective 11/1/2015 - Supplemental Rate Per Hour: \$31.29

(Local #1281)

HEAT & FROST INSULATOR
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Heat & Frost Insulator (First Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

Heat & Frost Insulator (Second Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

Heat & Frost Insulator (Third Year)

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 70% of Journeyman's rate

Heat & Frost Insulator (Fourth Year)

Effective Period: 7/1/2015 - 6/30/2016
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: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$21.17
Supplemental Benefit Rate per Hour: \$17.33

House Wrecker - Second Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$22.32
Supplemental Benefit Rate per Hour: \$17.33

House Wrecker - Third Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$23.97
Supplemental Benefit Rate per Hour: \$17.33

House Wrecker - Fourth Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$26.53
Supplemental Benefit Rate per Hour: \$17.33

(Mason Tenders District Council)

**IRON WORKER - ORNAMENTAL
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)**

Iron Worker (Ornamental) - 1st Ten Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$36.50

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Iron Worker (Ornamental) - 11 -16 Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: \$37.62

Iron Worker (Ornamental) - 17 - 22 Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: \$38.73

Iron Worker (Ornamental) - 23 - 28 Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: \$40.97

Iron Worker (Ornamental) - 29 - 36 Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: \$43.20

Local #580)

IRON WORKER - STRUCTURAL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$25.48
Supplemental Benefit Rate per Hour: \$46.83

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$26.08
Supplemental Benefit Rate per Hour: \$46.83

Iron Worker (Structural) - 19 - 36 months

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$26.68
Supplemental Benefit Rate per Hour: \$46.83

(Local #40 and #361)

**LABORER (FOUNDATION, CONCRETE, EXCAVATING, STREET PIPE
LAYER & COMMON)**
(Ratio Apprentice to Journeyman: 1 to 1, 1 to 3)

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - First
1000 hours**

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$36.53

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -
Second 1000 hours**

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Rate Per Hour: \$36.53

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -
Third 1000 hours**

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Rate Per Hour: \$36.53

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -
Fourth 1000 hours**

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 90% of Journeyman's rate
Supplemental Rate Per Hour: \$36.53

(Local #731)

MARBLE MECHANICS

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Cutters & Setters - First 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Cutters & Setters - Second 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 55% of Journeyman's rate

Cutters & Setters - Third 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 65% of Journeyman's rate

Cutters & Setters - Fourth 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 75% of Journeyman's rate

Cutters & Setters - Fifth 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 85% of Journeyman's rate

Cutters & Setters - Sixth 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 95% of Journeyman's rate

Polishers & Finishers - First 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Polishers & Finishers - Second 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

Polishers & Finishers - Third 750 Hours

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Polishers & Finishers - Fourth 750 Hours

Effective Period: 7/1/2015 - 6/30/2016
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: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$21.39
Supplemental Benefit Rate per Hour: \$18.44

Mason Tender - Second Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$22.54
Supplemental Benefit Rate per Hour: \$18.44

Mason Tender - Third Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$24.29
Supplemental Benefit Rate per Hour: \$18.49

Mason Tender - Fourth Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$26.95
Supplemental Benefit Rate per Hour: \$18.49

(Local #79)

METALLIC LATHER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Metallic Lather (First Year -Called Prior to 6/29/11)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$29.41

Supplemental Benefit Rate per Hour: \$22.89

Metallic Lather (Second Year - Called Prior to 6/29/11)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$34.01

Supplemental Benefit Rate per Hour: \$24.54

Metallic Lather (Third Year - Called Prior to 6/29/11)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$39.07

Supplemental Benefit Rate per Hour: \$25.69

Metallic Lather (First Year -Called On Or After 6/29/11)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$23.01

Supplemental Benefit Rate per Hour: \$17.95

Metallic Lather (Second Year - Called On Or After 6/29/11)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$28.11

Supplemental Benefit Rate per Hour: \$17.95

Metallic Lather (Third Year - Called On Or After 6/29/11)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$33.21

Supplemental Benefit Rate per Hour: \$17.95

(Local #46)

MILLWRIGHT

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.23

Supplemental Benefit Rate per Hour: \$34.06

Millwright (Second Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$32.18

Supplemental Benefit Rate per Hour: \$37.62

Millwright (Third Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$37.13

Supplemental Benefit Rate per Hour: \$41.83

Millwright (Fourth Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$47.03

Supplemental Benefit Rate per Hour: \$48.31

(Local #740)

PAVER AND ROADBUILDER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Paver and Roadbuilder - First Year (Minimum 1000 hours)

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.05

Supplemental Benefit Rate per Hour: \$17.12

Paver and Roadbuilder - Second Year (Minimum 1000 hours)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$28.69

Supplemental Benefit Rate per Hour: \$17.12

(Local #1010)

PAINTER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Painter - Brush & Roller - First Year

Effective Period: 7/1/2015 - 10/31/2015

Wage Rate per Hour: \$15.80

Supplemental Benefit Rate per Hour: \$11.88

Effective Period: 11/1/2015 - 6/30/2016

Wage Rate per Hour: \$16.40

Supplemental Benefit Rate per Hour: \$12.13

Painter - Brush & Roller - Second Year

Effective Period: 7/1/2015 - 10/31/2015

Wage Rate per Hour: \$19.75

Supplemental Benefit Rate per Hour: \$15.73

Effective Period: 11/1/2015 - 6/30/2016

Wage Rate per Hour: \$20.50

Supplemental Benefit Rate per Hour: \$15.98

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2015 - 10/31/2015

Wage Rate per Hour: \$23.70

Supplemental Benefit Rate per Hour: \$18.64

Effective Period: 11/1/2015 - 6/30/2016

Wage Rate per Hour: \$24.60

Supplemental Benefit Rate per Hour: \$18.89

Painter - Brush & Roller - Fourth Year

Effective Period: 7/1/2015 - 10/31/2015

Wage Rate per Hour: \$31.60

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$24.02

Effective Period: 11/1/2015 - 6/30/2016

Wage Rate per Hour: \$32.80

Supplemental Benefit Rate per Hour: \$24.27

(District Council of Painters)

PAINTER - STRUCTURAL STEEL

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Painters - Structural Steel (First Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

Painters - Structural Steel (Second Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

Painters - Structural Steel (Third Year)

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

(Local #806)

PLASTERER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Plasterer - First Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Rate Per Hour: \$15.76

Plasterer - First Year: 2nd Six Months

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 45% of Journeyman's rate
Supplemental Rate Per Hour: \$16.24

Plasterer - Second Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$18.21

Plasterer - Second Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Rate Per Hour: \$19.29

Plasterer - Third Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 70% of Journeyman's rate
Supplemental Rate Per Hour: \$21.46

Plasterer - Third Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Rate Per Hour: \$22.54

(Local #530)

PLUMBER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$14.00
Supplemental Benefit Rate per Hour: \$0.71

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate per Hour: \$14.00

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$2.96

Plumber - Second Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$23.87

Supplemental Benefit Rate per Hour: \$12.76

Plumber - Third Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$25.97

Supplemental Benefit Rate per Hour: \$12.76

Plumber - Fourth Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$28.82

Supplemental Benefit Rate per Hour: \$12.76

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$30.22

Supplemental Benefit Rate per Hour: \$12.76

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$42.29

Supplemental Benefit Rate per Hour: \$12.76

(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

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$25.01

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
\$220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: \$4.75

Pointer - Waterproofer, Caulker Mechanic - Second Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$27.25

Supplemental Benefit Rate per Hour: \$9.70

Pointer - Waterproofer, Caulker Mechanic - Third Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$32.24

Supplemental Benefit Rate per Hour: \$12.45

Pointer - Waterproofer, Caulker Mechanic - Fourth Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate per Hour: \$38.66

Supplemental Benefit Rate per Hour: \$12.45

(Bricklayer District Council)

ROOFER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 2)

Roofer - First Year

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 35% of Journeyman's Rate

Roofer - Second Year

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 50% of Journeyman's Rate

Roofer - Third Year

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 60% of Journeyman's Rate

Roofer - Fourth Year

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

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 (0-6 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 25% of Journeyman's rate
Supplemental Rate Per Hour: \$6.24

Sheet Metal Worker (7-18 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 35% of Journeyman's rate
Supplemental Rate Per Hour: \$16.71

Sheet Metal Worker (19-30 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 45% of Journeyman's rate
Supplemental Rate Per Hour: \$23.00

Sheet Metal Worker (31-36 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$27.02

Sheet Metal Worker (37-42 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Rate Per Hour: \$29.06

Sheet Metal Worker (43-48 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 70% of Journeyman's rate
Supplemental Rate Per Hour: \$33.10

Sheet Metal Worker (49-54 Months)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Rate Per Hour: \$35.12

Sheet Metal Worker (55-60 Months)

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyman's rate
Supplemental Rate Per Hour: \$37.15

(Local #28)

SIGN ERECTOR

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Sign Erector - First Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 35% of Journeyman's rate
Supplemental Rate Per Hour: \$13.18

Sign Erector - First Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 40% of Journeyman's rate
Supplemental Rate Per Hour: \$14.95

Sign Erector - Second Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 45% of Journeyman's rate
Supplemental Rate Per Hour: \$16.74

Sign Erector - Second Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Rate Per Hour: \$18.52

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$24.94

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: \$26.87

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: \$29.47

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: \$31.46

Sign Erector - Fifth Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: \$33.43

Sign Erector - Sixth Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: \$35.41

(Local #137)

STEAMFITTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Steamfitter - First Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate and Supplemental Per Hour: 40% of Journeyperson's rate

Steamfitter - Second Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate and Supplemental Rate Per Hour: 50% of Journeyperson's rate.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Steamfitter - Third Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate and Supplemental Rate per Hour: 65% of Journeyperson's rate.

Steamfitter - Fourth Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate and Supplemental Rate Per Hour: 80% of Journeyperson's rate.

Steamfitter - Fifth Year

Effective Period: 7/1/2015 - 6/30/2016

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: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Second 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

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: 7/1/2015 - 6/30/2016

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: 7/1/2015 - 6/30/2016

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: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 90% of Journeyman's rate
Supplemental Rate Per Hour: 50% of Journeyman's rate

Stone Mason - Setters - Sixth 750 Hours

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 100% of Journeyman's rate
Supplemental Rate Per Hour: 50% of Journeyman's rate

(Bricklayers District Council)

TAPER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Drywall Taper - First Year

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

Drywall Taper - Second Year

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

Drywall Taper - Third Year

Effective Period: 7/1/2015 - 6/30/2016
Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

(Local #1974)

TILE LAYER - SETTER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Tile Layer - Setter - First 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Tile Layer - Setter - Second 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Tile Layer - Setter - Third 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Tile Layer - Setter - Fourth 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Tile Layer - Setter - Fifth 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Tile Layer - Setter - Sixth 750 Hours

Effective Period: 7/1/2015 - 6/30/2016

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: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 40% of Journeyperson's rate

Supplemental Rate Per Hour: \$31.54

Timberperson - Second Year

Effective Period: 7/1/2015 - 6/30/2016

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$31.54

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
§220 APPRENTICESHIP PREVAILING WAGE SCHEDULE

Timberperson - Third Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: \$31.54

Timberperson - Fourth Year

Effective Period: 7/1/2015 - 6/30/2016
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: \$31.54

(Local #1536)







NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

June 01, 2013

**DDC STANDARD GENERAL CONDITIONS
FOR SINGLE CONTRACT PROJECTS**

June 01, 2013



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

No Text



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013
Revised - January 15, 2015

**DDC STANDARD GENERAL CONDITIONS
FOR SINGLE CONTRACT PROJECTS**



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013
Revised - January 15, 2015

No Text



NEW YORK CITY DEPARTMENT OF
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Issue Date - June 01, 2013
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**DIVISION 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013
Revised - January 15, 2015

NO TEXT



**SECTION 01 10 00
SUMMARY**

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. Addendum to the General Conditions: These General Conditions include and are supplemented by the Addendum to the General Conditions (the "Addendum"). The Addendum includes the following: (1) schedules referred to in these General Conditions (Schedule A through F), (2) information regarding the applicability of various articles, and (3) amended articles, if any.

1.2 SUMMARY:

- A. This section includes the following:
 - 1. Scope and Intent
 - 2. Provisions Referenced in the Contract
 - 3. Performance of Work During Non-Regular Work Hours (Pursuant to a Change Order)
 - 4. Interruption of Services at Existing Facilities

1.3 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 SCOPE AND INTENT:

- A. Description of Project: Refer to the Addendum for a description of the project.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4.B

- B. LEED: The City of New York will seek U.S. Green Building Council (USGBC) LEED (Leadership in Energy and Environmental Design) certification for this Project as specified in Section 01 81 13, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS" and the Addendum to the General Conditions.



REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4.C

- C. **COMMISSIONING:** The project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS, and the Addendum to the General Conditions. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.
- D. **PROGRESS SCHEDULE:** Refer to Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION for requirements of the project.
- E. **COMPLETION OF WORK:** Work to be done under the Contract is comprised of the furnishing of all labor, materials, equipment and other appurtenances, and obtaining all regulatory agency approvals necessary and required to complete the construction work in accordance with the Contract.
- F. **OMISSION OF DETAILS:** All work called for in the Specifications applicable to the 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. The cost of such work shall be deemed included in the total Contract Price.
- G. **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. The cost of such work shall be deemed included in the total Contract Price.
- H. **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.
- I. **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 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.

1.5 CONTRACT DRAWINGS AND SPECIFICATIONS:

- A. **SCHEDULE C -** The Contract Drawings are listed in Schedule C, which is set forth in the Addendum. Such drawings referred to in the Contract, and in the applicable Specifications for the Contract, bear the general title:

City of New York
Department of Design and Construction
Division of Public Buildings
- B. **DOCUMENTS FURNISHED TO THE CONTRACTOR -** After the award of the Contract, the Contractor will be furnished with five (5) complete sets of paper prints of all Contract Drawings mentioned in Paragraph A above, as well as a copy of the Specifications.
- C. **ADDITIONAL COPIES** of Drawings and Specifications, when requested, will be furnished to the Contractor if available.



- D. **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.
- E. **COMPENSATION** - Where Supplementary Drawings entail extra work, compensation therefore 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.
- F. **SUPPLEMENTARY DRAWING PRINTS** - Three (3) copies of prints of these Supplementary Drawings will be furnished to the Contractor.
- G. **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.

1.6 COORDINATION:

- A. **COORDINATION AND COOPERATION** - The Contractor shall consult and study the requirements of the Contract Drawings and Specifications for all required work, including all work to be performed by trade subcontractors, 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.
- B. **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.

1.7 SHOP DRAWINGS AND RECORD DRAWINGS:

Refer to Division I Section 01 33 00 – SUBMITAL PROCEDURES and Section 01 78 39 – PROJECT RECORD DRAWINGS for requirements applicable to shop drawings and record drawings.

1.8 TEMPORARY FACILITIES, SERVICES AND CONTROLS:

Refer to Division I Section 01 50 00 – TEMPORARY FACILITIES SERVICES AND CONTROLS for the responsibilities of the Contractor.

1.9 DUST CONTROL:

The Contractor shall prepare, execute and manage a "Dust Control Plan" for the prevention of the emission of dust from construction related activities in compliance with 15 RCNY 13-01 et. seq.

1.10 PROVISIONS REFERENCED IN THE CONTRACT:

- A. **SCHEDULE 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, sets forth (1) the referenced Articles of the Contract, and (2) the specific requirements applicable to the Contract.



- B. EXTENSION OF TIME - 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 therefore.
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 Documents, the Contractor shall remove and replace, at Contractor's own cost, such defective or improperly incorporated material with materials complying with the Contract Documents. 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 therefore 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. **MOBILIZATION PAYMENT** – A line item for mobilization shall be allowed on the Contractor's Detailed Bid 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 Bid Breakdown 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 | x | = \$ 6,000 |
| \$ 100,001 - \$ 500,000 | x 6 | = \$ 6,000 (min) - \$ 30,000 (max) |
| \$ 500,000 - \$ 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.

E. **ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING:** The Contractor shall submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel in Non-Road Vehicles, and the implementation of Best Available Technology (BAT), as set forth in Article 5.4 of the Contract. Such reports shall be submitted in accordance with the schedule, format, directions and procedures established by the Commissioner.

1.11 PERFORMANCE OF WORK DURING NON-REGULAR WORK HOURS:

- A. **NON-REGULAR WORK HOURS:** The Commissioner may issue a change order in accordance with Article 25 of the Contract which (1) directs the Contractor to perform the Work, or specific components thereof, during other than regular work hours (i.e., evenings, weekends and holidays), and (2) provides compensation to the Contractor for costs in connection with the performance of Work during other than regular work hours. The Commissioner may issue a change order if a delay has occurred and such delay is not the fault of the Contractor, or if the work is of such an important nature that delay in completing such work would result in serious disadvantage to the public.
- B. **PROCEDURE:** The Contractor shall (1) obtain whatever permits may be required for performance of the work during other than regular business hours, and (2) pay all necessary fees in connection with such permits. In addition, if directed by the Commissioner, the Contractor shall make immediate application to the Commissioner of the Department of Labor, State of New York, for dispensation in accordance with Subdivision 2 of Section 220 of the Labor Law.

1.12 INTERRUPTION OF SERVICES AT EXISTING FACILITIES:

- A. **EVENING AND WEEKEND WORK** - Where performance of the Work requires the temporary shutdown(s) of services, such shutdown(s) shall be made at night or on weekends or at such times that will cause no interference with the established routines and operations of the facility 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. Components of the Work that must be performed during other than regular work hours are indicated in the Drawings and/or the Specifications.
- B. **INTERRUPTION OF EXISTING FACILITIES:**
- 1 The Contractor shall not interrupt any of the services of the facility nor interfere with such services 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 shall the Contractor, its subcontractors, 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 Toilet facilities, water and electricity must be operational at all times (i.e. 24/7). No services of the facility 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 at the facility.
 - 5 The Contractor shall schedule the work to avoid noise interference that will affect the normal functions of the facility. In particular, construction operations producing noises that are objectionable to the functions of the facility must be scheduled at times of day or night, day of the week, or weekend, which will not interfere with personnel at the facility. Any additional cost resulting from this scheduling shall be borne by the Contractor.



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- 6 The Contractor shall arrange to work continuously, including evening and weekend hours, if required, to assure that services will be shut down only during the time actually required to make the necessary connections to the existing facility.
- 7 The Contractor shall give ample written notice in advance to the Commissioner and personnel at the facility of any required shutdown.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 10 00

SUMMARY
01 10 00 -8



SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. LEED: Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS."
- C. COMMISSIONING: Refer to the Addendum to identify whether this project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.

1.2 SUMMARY:

- A. This Section includes administrative provisions for coordinating construction operations on the Project including without limitation the following.
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.
 - 4. Requests for Interpretation (RFIs).
- B. This section includes the following:
 - 1. Definitions
 - 2. Coordination
 - 3. Submittals
 - 4. Administrative and Supervisory Personnel
 - 5. Project Meetings
 - 6. Requests for Interpretation (RFI's)
 - 7. Correspondence
 - 8. Contractor's Daily Reports
 - 9. Alternate and Substitute Equipment
- C. RELATED SECTIONS: include without limitation the following:
 - 1. Section 01 10 00 SUMMARY
 - 2. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
 - 3. Section 01 33 00 SUBMITTALS
 - 4. Section 01 35 26 SAFETY REQUIREMENTS
 - 5. Section 01 73 00 EXECUTION REQUIREMENTS
 - 6. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL



7. Section 01 77 00 PROJECT CLOSEOUT PROCEDURES

1.3 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 COORDINATION:

- A. Coordination: The Contractor shall coordinate its construction operations, including those of its subcontractors, with other entities to ensure the efficient and orderly installation of each part of the Work. The Contractor shall coordinate the various operations required by different Sections of the Specifications that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence in order to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
 - 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
- B. The Contractor shall prepare memoranda for distribution to its subcontractors and other involved entities, outlining special procedures required for coordination. Such memoranda shall include required notices, reports, and meeting minutes as applicable.
- C. Administrative Procedures: The Contractor shall coordinate scheduling and timing of required administrative procedures with other construction activities and activities of its subcontractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include without limitation the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Installation and removal of temporary facilities and controls.
 - 3. Delivery and processing of submittals.
 - 4. Progress meetings.
 - 5. Pre-installation conferences..
 - 6. Startup and adjustment of systems.
 - 7. Project closeout activities.
- D. Conservation: The Contractor shall coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.



- E. Salvaged Items, Material and/or Equipment: The Specifications may identify certain items, materials or equipment which must be salvaged by the Contractor and handled or disposed of as directed. The Contractor shall comply with all directions in the Specifications regarding the salvaging and handling of identified items, material or equipment.

1.5 SUBMITTALS:

- A. Submit shop drawings, product data, samples etc. in compliance with Section 01 33 00, SUBMITTAL PROCEDURES.
- B. Coordination Drawings: The Contractor shall prepare applicable Coordination Drawings in compliance with the requirements for Coordination Drawings in Section 01 33 00, SUBMITTAL PROCEDURES.
- C. Safety Plan in compliance with Section 01 35 26, SAFETY REQUIREMENTS PROCEDURES.
- D. Waste Management Plan in compliance with Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
- E. Key Personnel Names: Within 15 days after the Notice to Proceed, the Contractor shall submit a list of key personnel assignments of the Contractor and its subcontractors, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in case of the absence of individuals assigned to Project.
 - 1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.
 - 2. In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work. Include special personnel required for coordinating all operations by its subcontractors.

1.6 PROJECT MEETINGS:

- A. General: The Resident Engineer will hold regularly scheduled construction progress meetings at the site, at which time the Contractor and appropriate subcontractors shall have their representatives present to discuss all details relative to the execution of the work. The Resident Engineer shall preside over these meetings.
 - 1. Agenda: Prior to each meeting, the Resident Engineer will consult with the Contractor 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 the Contractor will then dictate a brief statement for the record.
 - 2. Coordination: In addition to construction progress meetings called by the Resident Engineer, the Contractor shall hold regularly scheduled meetings for the purpose of coordinating; expediting and scheduling the work in accordance with the master coordinated Job Progress Chart. The Contractor and its subcontractors, material suppliers or vendors whose presence is necessary, are required to attend. These meetings may, at the discretion of the Contractor, be held at the same place and immediately following the project meetings held by the Resident Engineer. Minutes of these meetings shall be recorded, typed and printed by the Contractor and distributed to all parties concerned.
- B. PRECONSTRUCTION KICK-OFF MEETING:
 - 1. The Resident Engineer will schedule a preconstruction kick-off meeting either at DDC's main office or at the Project site to review responsibilities and personnel assignments and clarify the



role of each participant. Unless otherwise directed the Design Consultant will record and distribute meeting minutes.

2. Attendees: Authorized representative of the Client Agency; Design Consultant; the Contractor and its superintendents, subcontractor(s) and their superintendent(s); LEED sub-consultant and Commissioning Authority /Agent (CxA) as applicable and other concerned parties. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Contract Work.
3. Agenda: Includes without limitation the following as applicable:
 - a. Establishing construction schedule
 - b. Schedule for regular construction meetings
 - c. Phasing
 - d. Critical work sequencing and long-lead items
 - e. Designation of key personnel and their duties
 - f. Reviewing Application for Payment and Change Order Procedures
 - g. Procedures for Requests for Information (RFIs.)
 - h. Review Permits and Approval requirements
 - i. Review all recent Administrative Code reporting requirements relating to the project, (i.e. LL 77, LL86 etc.)
 - j. Procedures for testing and inspecting
 - k. Reviewing special conditions at the Project site
 - l. Distribution of the Contract Documents
 - m. Submittal procedures
 - n. Safety Procedures
 - o. LEED requirements
 - p. Commissioning Requirements
 - q. Preparation of Record Documents
 - r. Historic Treatment requirements
 - s. Use of the premises
 - t. Work restrictions
 - u. Client Agency occupancy requirements
 - v. Responsibility for temporary facilities, services and controls
 - w. Construction Waste Management and Disposal
 - x. Indoor Air Quality Management Plan
 - y. Dust Mitigation Plan
 - z. Office, work, and storage areas
 - aa. Equipment deliveries and priorities
 - bb. Security
 - cc. Progress cleaning
 - dd. Working hours



C. CONSTRUCTION PROGRESS MEETINGS:

1. The Resident Engineer will schedule and conduct construction progress meetings at bi-weekly intervals or as otherwise determined. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work. Unless otherwise directed the Design Consultant will record and distribute meeting minutes.
2. Attendees:
 - a. Design Consultant and applicable sub-consultants
 - b. Client Agency Representative
 - c. Representatives from the Contractor, sub-contractor(s), suppliers or other entities involved in the current progress, planning, coordination or future activities of the Work
 - d. Other appropriate DDC personnel, DDC consultants and concerned parties
3. Agenda: Includes without limitation the following:
 - a. Review the Construction Schedule and progress of the Work. Determine if the Work is on time, ahead of schedule or behind schedule. Determine actions to be taken to maintain or accelerate the schedule
 - b. Review and approve prior meeting minutes and follow up open issues
 - c. Coordinate work between each subcontractor
 - d. Sequence of Operations
 - e. Status of submittals, deliveries and off-site fabrication
 - f. Status of inspections and approvals by governing agencies
 - g. Temporary facilities and controls
 - h. Review Site Safety
 - i. Quality and work standards
 - j. Field observations
 - k. Status of correction of deficient items
 - l. RFI's
 - m. Pending changes
 - n. Status of outstanding Payments and Change Orders
 - o. LEED requirements including Construction Waste Management, Indoor Air Quality Plan, Dust Mitigation and Commissioning
 - p. Status of Administrative Code reporting requirements related to the project

1.7 REQUESTS FOR INFORMATION (RFI):

- A. Procedure: Immediately on discovery of the need for information or interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, the Contractor shall prepare and submit an RFI in the form specified by the Resident Engineer.
 1. RFI shall originate with the Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 2. Coordinate and submit RFI in a prompt manner to the Resident Engineer so as to avoid delays in Contractor's work or work of its subcontractors.
 3. RFI Log: The Contractor shall prepare, maintain, and submit a tabular log of RFIs organized by the RFI number monthly to the Resident Engineer.



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4. On receipt of responses and action to the RFI, the Contractor shall update the RFI log and immediately distribute the RFI response to affected parties. Review response(s) and notify the Resident Engineer immediately if the Contractor disagrees with response(s).

1.8 CORRESPONDENCE:

Copies of all correspondence to DDC shall be sent directly to the Resident Engineer at the job site.

1.9 CONTRACTOR'S DAILY REPORTS:

The Contractor shall prepare and submit Daily Construction Progress Reports as outlined in Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 31 00



SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for establishing an effective base line schedule for the project and documenting the progress of construction during performance of the Work by developing, revising as necessary, various documents including but not limited to the following:
1. Baseline Construction Schedule.
 2. Composite Schedule for entire project
 3. Recovery Composite Schedule
 4. Revised and/or updated Composite Schedule
 5. Submittals Schedule.
 6. Daily construction reports.
 7. Material location reports.
 8. Field condition reports.
 9. Special reports.
- B. RELATED SECTIONS: include without limitation the following:
1. Section 01 10 00 SUMMARY
 2. Section 01 32 22 PHOTOGRAPHIC DOCUMENTATION
 3. Section 01 33 00 SUBMITTAL PROCEDURES
 4. Section 01 40 00 QUALITY REQUIREMENTS

1.3 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

- C. **Baseline Construction Schedule:**
A horizontal bar chart type schedule (Microsoft Project OR similar program) listing all the activities and their duration for entire contract duration OR construction period, including logical ties and interrelations between the activities necessary for the timely and successful completion of the project. Critical path activities shall be clearly marked. The Baseline construction schedule is a preliminary schedule that must be reviewed and approved by the Resident Engineer.
- D. **Composite Schedule:**
A composite horizontal bar chart type schedule (Microsoft Project OR similar program) listing all activities to be performed by the Contractor and its subcontractors, the duration of each activity including logical ties and interrelations between activities, and the sequence of each of necessary activities for the timely and successful completion of the project within the stipulated contract duration. Critical path activities shall be clearly marked. The Composite schedule must be signed and submitted by the Contractor within thirty (30) calendar days after the date established for commencement of the Contract, unless otherwise directed. The Composite Schedule must be reviewed and approved by the Resident Engineer.
- E. **Recovery Composite Schedule:** A Recovery Composite Schedule is not required unless the City issues an Acceleration Change Order.

A Composite Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the project within the stipulated contract duration, plus authorized time extensions. In such case special attention must be given to keep the delays as minimum as possible and must establish the nature of efforts such as extended hours of work, weekend work, accelerated fabrication, required action(s) or effort(s) by the Contractor, its subcontractors, consultants, clients, end users and/or other concerned parties.

Such schedule must be prepared and submitted within Five (5) calendar days of request by the Resident Engineer. The Recovery Composite Schedule must be reviewed and approved by the Resident Engineer.
- F. **Revised and/or Updated Composite Schedule:**

A Baseline construction schedule OR Composite Schedule OR Recovery Composite Schedule for the project that shows the actual duration of all the completed activities, including duration of and the reasons for delays, if any has occurred, AND revisions to all remaining activities of the Contractor and its subcontractors, including changes, if any, to logical ties, interrelations and the sequence of each of the outlined activities. Any such revisions should be shown on the row just below the approved schedule of the respective activity so that revisions can be compared.

The Revised and/or updated Composite Schedule must be reviewed and approved by the Resident Engineer.
- G. **Activity:** A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
- H. **Event:** The starting or ending point of an activity.
- I. **Fragment:** A part of the activity that breaks down activities into smaller activities for greater detail.
- J. **Milestone:** A key or critical point in time for reference or measurement.
- K. **Network Diagram:** A graphic diagram of a network schedule, showing activities and activity relationships.



PART II – PRODUCTS

2.1 BASELINE CONSTRUCTION SCHEDULE:

- A. The Contractor shall prepare a Baseline horizontal bar-chart-type construction schedule for the project. Submit the Baseline Construction Schedule to the Resident Engineer within (15) fifteen calendar days after the date established for commencement of the Contract, unless directed otherwise. The Baseline Schedule must be reviewed and approved by the Resident Engineer.
1. Provide a separate time bar for each significant construction activity. Coordinate each activity on the schedule with other construction activities for proper interrelationship & sequence.
 2. Duration: The duration of each activity on the schedule besides installation must clearly show required duration of filing for permits, inspections, testing, approvals, shop drawings and materials submittals and approvals, fabrication, delivery, phasing for each construction activity.
 3. Schedule shall be time-scaled in not more than weekly increments, with the dates of the first day (Monday) of each week indicated.
 4. Completion of all the project activities shall be indicated in advance of the date established for completion of the Contract, allowing time for required inspection and punch list work.
 5. Clearly show time bar for all the tasks, to be completed before start of physical work of scheduled activities, including but not limited to obtaining required permit, subcontractor approval, submission and approval of shop drawings, field verification, time for fabrication and delivery, testing of materials and/or samples, preparation and approval of mock-up sample, curing, pre-testing of soil, pre-testing of equipment - including start up, testing & adjusting, filing for inspection by regulatory agencies, training, final use, etc. required to maintain orderly progress of the activity. A special consideration must be given to those activities requiring early approvals because of long lead-time for manufacture or fabrication.
 6. Phasing: Arrange all activities in proper sequence to reflect requirements for phased completion, work by other entities, work by the City, City furnished items, coordination with existing work, limitations arising due to continued occupancies, non-interruptible services, partial completion for occupancy, site restrictions, provisions for future work, seasonal variations, environmental control, and similar conditions of the project.
 7. Arrange all activities and/or show interrelationship and logical sequence of all activities, determine and mark all critical path activities including any phasing reflecting actual project condition.
 8. Keep at least two blank horizontal bars between all activities for recording actual progress and submitting Revised Schedule as defined in Sub-Section 1.3 G
 9. If necessary a new revised schedule shall be prepared in the same manner as outlined above.

2.2 COMPOSITE SCHEDULE FOR THE PROJECT:

- A. The Contractor shall prepare a Composite Schedule based on the approved Baseline Schedule. Such schedule shall indicate graphically and chronologically the start and completion of each and every activity, including all the pre-activity and post activity tasks. Keep at least two blank horizontal bars between all activities for recording actual progress and/or revisions.
1. If necessary the Contractor shall meet with each subcontractor and with the Resident Engineer to review and make warranted adjustments and finalize the Composite Schedule. Once the schedule is finalized, the Contractor shall sign and date a reproducible form of the Composite Schedule. The Composite Schedule must be finalized and signed by the Contractor within (30) thirty calendar days after the date established for commencement of the Contract, unless directed otherwise. The Composite Schedule must be reviewed and approved by the Resident Engineer.

2.3 RECOVERY COMPOSITE SCHEDULE:

- A. A Recovery Composite Schedule is not required unless the City issues an Acceleration Change Order. A Recovery Composite Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the project within the stipulated contract duration, plus authorized time extensions, must be developed and submitted within (5) five calendar days of the request by the Resident Engineer. Such Recovery Composite Schedule shall include all information as defined in Article 1.3 F and shall be prepared in the same manner as outlined in Sub-Sections 2.1 and 2.2. The Recovery Composite Schedule must be reviewed and approved by the Resident Engineer.

2.4 REVISED AND/OR UPDATED COMPOSITE SCHEDULE:

- A. The Contractor shall revise and/or update the approved Composite Schedule as directed. The Revised schedule shall be prepared in the same manner as outlined above in Sub-Sections 2.1 and 2.2.
- B. The Contractor shall mark actual progress, delays, work stoppage etc. in the row just below the approved schedule for the respective activity so that revisions can be compared.
- C. Such schedule also shall indicate graphically and chronologically any revisions to the start and completion of the remaining activities including revisions to all the pre-activity and post activity tasks for all subcontractors.
- D. If necessary, the Contractor shall meet with each subcontractor and with the Resident Engineer to review and make warranted adjustments and finalize the Revised Composite Schedule. Once the schedule is finalized, the Contractor shall sign and date a reproducible form of the Schedule. Such schedule must be prepared and submitted by the Contractor within Five (5) calendar days of request by the Resident Engineer. The Revised Composite Schedule must be reviewed and approved by the Resident Engineer.

2.5 SUBMITTALS SCHEDULE:

- A. Preparation: The Contractor shall submit a schedule of submittals, arranged in chronological order by dates required by the construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
- B. SCHEDULE F: Schedule F sets forth all submittal requirements for shop drawings and material samples. Schedule F is included in the Addendum. At the kick-off meeting, the Contractor must review this Schedule with the Resident Engineer and the Design 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 business 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 business 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.
- C. Review: The Resident Engineer will review the Schedule F submitted by Contractor. Upon acceptance, the Resident Engineer will date and sign the schedule as approved and transmit it to the Consultant, Contractor and others within DDC as he/she deems appropriate.



2.6 REPORTS:

- A. Daily Construction Reports: The Contractor shall submit to the Resident Engineer written Daily Construction Reports at the end of each work day, recording basic information such as the date, day, weather conditions, and contract days passed, remaining contract duration/days and the following information concerning the Project.

Information: The reports shall be prepared by the Contractor's Superintendent and shall bear the Contractor's Superintendents signature. Each report shall contain the following information:

1. List of name of Contractor, subcontractors, their work force in each category, and details of activities performed.
2. The type of materials and/or major equipment being installed by the Contractor and/or by each subcontractor.
3. The major construction equipment being used by the Contractor and/or subcontractors.
4. Material and Equipment deliveries.
5. High and low temperatures and general weather conditions.
6. Accidents.
7. Meetings and significant decisions.
8. Unusual events.
9. Stoppages, delays, shortages, and losses.
10. Meter readings and similar recordings
11. Emergency procedures.
12. Orders and/or requests of authorities having jurisdiction.
13. Approved Change Orders received and implemented.
14. Field Orders and Directives received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial Completions and occupancies.
18. Substantial Completions authorized.

NOTE: If there is NO ACTIVITY at site, a daily report indicating so and the reason for no activity at the site must be submitted.

- B. Material Location Reports: The contractor shall submit a Material Location Report at weekly OR monthly intervals as determined and established by the Resident Engineer. Such report shall include a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit a Request For Information (RFI) form with a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.7 SPECIAL REPORTS:

- A. Accident report, incident report, special condition report for the conditions out of control of any party involved with the project effecting project progress, explaining impact on the project schedule and cost if any.

PART III – EXECUTION (Not Used)
END OF SECTION 01 32 00



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No Text

CONSTRUCTION PROGRESS DOCUMENTATION
01 32 00 - 6



**SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION**

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 33

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract]

1.2 SUMMARY:

- A. This Section includes the following:
1. Photographic Media
 2. Construction Photographs
 3. Pre-construction Photographs
 4. Periodic Construction Progress Photographs
 5. Special Photographs
 6. DVD Recordings
 7. Final Completion Construction Photographs
- B. RELATED SECTIONS: include without limitation the following:
1. Section 01 10 00 SUMMARY
 2. Section 01 33 00 SUBMITTAL PROCEDURES
 3. Section 01 35 91 HISTORIC TREATMENT PROCEDURES
 4. Section 01 78 39 CONTRACT RECORD DOCUMENTS
 5. Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS
- C. PHOTOGRAPHER - The Contractor shall employ and pay for the services of a professional photographer who shall take photographs showing the progress of the work for all Contracts.

1.3 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 SUBMITTALS:

- A. Qualification Data: For photographer.

- B. Key Plan: With each Progress Photograph Submittal include a key plan of Project site and building with notation of vantage points marked for location and direction of each image. Indicate location, elevation or story of construction. Include same label information as corresponding set of photographs.
- C. Construction Progress Photograph Prints: Take Progress Photographs bi-weekly and submit four color prints of each photographic view for each trade to the Resident Engineer. Such photographs shall be included in each monthly progress report or as otherwise directed by the Resident Engineer.
- D. Construction Photograph Negatives: Submit a complete set of photographic negatives in individually protected negative sleeves with each submittal of prints. Identify negatives with label matching photographic prints.
- E. Digital Images: If Digital Media is used, submit a complete set of digital color image electronic files on CD-ROM with each submittal of prints. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, un-cropped.

1.5 QUALITY ASSURANCE:

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.6 COORDINATION:

- A. The Contractor and its subcontractor(s) shall cooperate with the photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, including temporary lighting required to produce clear, well-lit photographs without obscuring shadows.

1.7 COPYRIGHT:

- A. The Contractor shall include the provisions set forth below in the agreement between the Contractor and the Photographer who will provide the construction photographs described in this section. The Contractor shall submit to the Resident Engineer a copy of its agreement with the Photographer.
- B. Any photographs, images and/or other materials produced pursuant to this Agreement, and any and all drafts and/or other preliminary materials in any format related to such items produced pursuant to this Agreement, shall upon their creation become the exclusive property of the City.
- C. Any photographs, images and/or other materials provided pursuant to this Agreement ("Copyrightable Materials") shall be considered "work-made-for-hire" within the meaning and purview of Section 101 of the United States Copyright Act, 17 U.S.C. § 101, and the City shall be the copyright owner thereof and of all aspects, elements and components thereof in which copyright protection might exist. To the extent that the Copyrightable Materials do not qualify as "work-made-for-hire," the Photographer hereby irrevocably transfers, assigns and conveys exclusive copyright ownership in and to the Copyrightable Materials to the City, free and clear of any liens, claims, or other encumbrances. The Photographer shall retain no copyright or intellectual property interest in the Copyrightable Materials. The Copyrightable Materials shall be used by the Photographer for no purpose other than in the performance of this Agreement without the prior written permission of the City. The Department may grant the Photographer a license to use the Copyrightable Materials on such terms as determined by the Department and set forth in the license.
- D. The Photographer acknowledges that the City may, in its sole discretion, register copyright in the Copyrightable Materials with the United States Copyright Office or any other government agency authorized to grant copyright registrations. The Photographer shall fully cooperate in this effort, and agrees to provide any and all documentation necessary to accomplish this.



- E. The Photographer represents and warrants that the Copyrightable Materials: (i) are wholly original material not published elsewhere (except for material that is in the public domain); (ii) do not violate any copyright Law; (iii) do not constitute defamation or invasion of the right of privacy or publicity; and (iv) are not an infringement, of any kind, of the rights of any third party. To the extent that the Copyrightable Materials incorporate any non-original material, the Photographer has obtained all necessary permissions and clearances, in writing, for the use of such non-original material under this Agreement, copies of which shall be provided to the City.

PART II – PRODUCTS

2.1 PHOTOGRAPHIC MEDIA:

- A. Photographic Film: Medium format, 2-1/4 by 2-1/4 inches (60 by 60 mm).
- B. Digital Images:
1. Construction Progress Images: Color images in JPEG format with minimum sensor size of 1.3 megapixels.
 2. Presentation Quality Images: Provide Color images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1024 by 768 with 8"x10" original capture at 300 dpi or greater.
- C. Prints:
1. Format: 8-by-10-inch (203-by-254-mm) smooth-surface matte color prints on single-weight commercial-grade stock paper, with 1inch wide margins and punched for standard 3-ring binder.
 2. Identification: On the front of each photograph affix a label in the margin with Project name and date photograph was taken. On the back of each print, provide an applied label or rubber-stamped impression with the following information:
 - a. Project Contract I.D. Number.
 - b. Project Contract Name.
 - c. Name of Contractor. (and Subcontractor Trade Represented)
 - d. Subject of Image Taken.
 - e. Date and time photograph was taken if not date stamped by camera.
 - f. Description of vantage point, indicating location, direction and other pertinent information.
 - g. Unique sequential identifier.
 - h. Name and address of photographer.

PART III – EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS:

- A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
1. Maintain key plan with each set of construction photographs that identifies each photographic location and direction of view.
- B. Film Images:
1. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.



2. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Commissioner.
- C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 1. Date and Time: Include date and time in filename for each image.
 2. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Commissioner.

3.2 PRE-CONSTRUCTION & PRE-DEMOLITION PHOTOGRAPHS:

- A. Before commencement of Contract work at the site, take color photographs of Project site and surrounding properties, including existing structures or items to remain during construction, from different vantage points, as directed by the Resident Engineer.
 1. Flag applicable excavation areas and construction limits before taking construction photographs.
 2. Take photographs of minimum eight (8) views to show existing conditions adjacent to property before starting the Work.
 3. Take applicable photographs of minimum eight (8) views of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 4. Take additional photographs as required or directed by the Resident Engineer to record settlement or cracking of adjacent structures, pavements, and improvements.
- B. Demolition Operations: Take photographs as directed by the Resident Engineer of minimum of eight (8) views each before commencement of demolition operations, at mid-point of operations and at completion of operations.
- C. Pre-Demolition Photographs: Take archival quality color photographs, to include all exterior building facades, of all structures at the Project site designated to be fully demolished or removed in compliance with NYC Building Code requirements. Submit four (4) complete sets of pre-demolition photographs, in the format specified herein, to the Resident Engineer for submission to the Department of Buildings.

3.3 PERIODIC CONSTRUCTION PROGRESS PHOTOGRAPHS:

- A. Take photographs of minimum eight (8) views bi-weekly as directed by the Resident Engineer of construction progress for each contract trade. Select vantage points to show status of construction and progress since last photographs were taken.

3.4 SPECIAL PHOTOGRAPHS:

- A. The photographer shall take special photographs of subject matter or events as specified in other sections of the Project Specifications from vantage points specified or as otherwise directed by the Resident Engineer.
- B. Historical Elements: As required in Section 01 35 91, HISTORIC TREATMENT PROCEDURES, for Contract work at designated landmark structures or sites the photographer, as specified and required by individual sections of the Contract documents or at the direction of the Commissioner, shall take images of existing elements scheduled to be removed for replacement, repair or replication in quantities as directed, including post-construction photographs of completed work as directed by the Commissioner.



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1. Take Presentation Quality Photographs of designated landmark structures as directed by the Commissioner for submission to the New York City Landmarks Preservation Commission. Provide a minimum of four color photographic prints of each view as directed.

3.5 DVD RECORDING:

- A. When DVD Recording of Demonstration and Training sessions is required for Non-Commissioned projects the Contractor shall provide the services of a Videographer as indicated in Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

3.6 FINAL COMPLETION CONSTRUCTION PHOTOGRAPHS:

- A. Take color photographs of minimum eight (8) unobstructed views of the completed project or project 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 is done after date of Substantial Completion for submission as Project Record Documents. Submit four (4) sets of each view of Presentation Quality photographic prints including negatives and/or digital images electronic file.

END OF SECTION 01 32 33



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PHOTOGRAPHIC DOCUMENTATION
01 32 33 - 6



**SECTION 01 33 00
SUBMITTAL PROCEDURES**

PART I – GENERAL:

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Coordination Drawings, Catalogue Cuts, Material Samples and other submittals required by the Contract Documents.
- B. Review of submittals does not relieve the Contractor of responsibility for any Contractor's errors or omissions in such submittals, nor from responsibility for complying with the requirements of the Contract.
- C. Responsibility of the 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.
- D. This Section includes the following:
1. Definitions
 2. Submission Procedures
 3. Coordination Drawings
 4. LEED Submittals
 5. Ultra Low Sulfur Diesel Fuel Reporting
 6. Construction Photographs and DVD Recordings
 7. As-Built Documents

1.3 RELATED SECTIONS: Include without limitation the following:

- | | | |
|----|------------------|--|
| A. | Section 01 10 00 | SUMMARY |
| B. | Section 01 31 00 | PROJECT MANAGEMENT AND COORDINATION |
| C. | Section 01 32 00 | CONSTRUCTION PROGRESS DOCUMENTATION |
| D. | Section 01 32 33 | PHOTOGRAPHIC DOCUMENTATION |
| E. | Section 01 77 00 | CLOSEOUT PROCEDURES |
| F. | Section 01 78 39 | CONTRACT RECORD DOCUMENTS |
| G. | Section 01 81 13 | SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS |

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or



combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

- C. **Submittals:** Written and graphic information that requires responsive actions and includes without limitation all shop drawings, product data, letters of certification, tests and other information required for quality control and as required by the Contract Documents.
- D. **Informational Submittals:** Written information that does not require responsive action. Submittals may be rejected for non-compliance with the Contract.
- E. **Shop Drawings:** Include drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, except for coordination drawings, specifically prepared for the project by the Contractor or any subcontractor, manufacturer, supplier or distributor, which illustrates how specific portions of the work shall be fabricated and/or installed.
- F. **Coordination Drawings:** As required in Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.
- G. **Product Data and Quality Assurance Submittals:** Includes manufacturer's standard catalogs, pamphlets and other printed materials including without limitation the following:
 - 1. Catalogue and Product specifications
 - 2. Installation instructions
 - 3. Color charts
 - 4. Catalog cuts
 - 5. Rough-in diagrams and templates
 - 6. Wiring diagrams
 - 7. Performance curves
 - 8. Operational range diagrams
 - 9. Mill reports
 - 10. Design data and calculations
 - 11. Certification of compliance or conformance
 - 12. Manufacturer's instructions and field reports

1.5 COORDINATION DRAWINGS:

- A. The Contractor shall provide reproducible Coordination Drawing(s) of the reflective ceiling showing the integration of all applicable contract work, including general construction work as well as trade work (Plumbing, HVAC, and Electrical) to be performed by subcontractors. The Coordination Drawing(s) shall include, without limitation, the following information:
 - 1. General Construction work showing the reflective ceiling plan including starting points, ceiling and beam soffits elevations, ceiling heights, roof openings, etc.
 - 2. HVAC Contract work showing ductwork, heating and sprinkler piping, location of grilles, registers etc. and access doors in hung ceilings. Locations shall be fixed by elevations and dimensions from column centerlines and/or walls.
 - 3. Plumbing Contract work including piping, valves, cleanouts etc., indicating locations and elevations and shall indicate the necessary access doors.
 - 4. Electrical Contract work indicating fixtures, large conduit runs, clearances, pull boxes, junction boxes, sound system speakers, etc.
- B. The Contractor shall issue the completed Coordination Drawing(s) to the Resident Engineer for his/her review. The Resident Engineer may call as many meetings as necessary with the Contractor, including



- attendance by applicable subcontractors, and may call on the services of the Design Consulting where necessary, to resolve any conflicts that become apparent.
- C. Upon resolution of any conflicts, the Contractor shall provide a final Coordination Drawing(s) which will become the Master Coordination Drawing(s). The Master Coordination Drawing(s) shall be signed and dated by the Contractor to indicate acceptance of the arrangement of the work.
 - D. A reproducible copy of the Master Coordination Drawing(s) shall be provided by the Contractor to each of the appropriate subcontractor(s), the Resident Engineer and the Design Consultant for information.
 - E. Shop Drawings shall not be submitted prior to acceptance of the final coordinated drawings and shall be prepared in accordance with the Master Coordination Drawing(s). No work will be permitted without accepted Shop Drawings. It is therefore essential that this procedure be instituted as quickly as possible.

1.6 SUBMITTAL PROCEDURES:

- A. Refer to Section 01 35 03 GENERAL MECHANICAL REQUIREMENTS and Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS for additional submittal requirements involving electrical and mechanical work or equipment of any nature called for the project.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activities, with the Submittal Schedule specified in Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - 3. The Commissioner reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: The Submittals Schedule is set forth in Schedule F, which is included in the Addendum.
- D. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Design Consultant.
 - 3. Include the following minimum information on label for processing and recording action taken:
 - a. Project name, DDC Project Number and Contract Number
 - b. Date
 - c. Name and address of Design Consultant
 - d. Name and address of Contractor
 - e. Name and address of subcontractor
 - f. Name and address of supplier
 - g. Name of manufacturer
 - h. Submittal number or other unique identifier, including-revision identifier
 - i. Number and title of appropriate Specification Section
 - j. Drawing number and detail references, as appropriate
 - k. Location(s) where product is to be installed, as appropriate
 - l. Other necessary identification
- E. Transmittal:
 - 1. Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form in triplicate. Transmittals received from sources other than the



Contractor will be returned without review. Re-submission of the same drawings or product data shall bear the original number of the prior submission and the original titles.

2. Transmittal Form: Provide locations on form for the following information:

- a. Project name, DDC Project number and Contract Number
- b. Date
- c. Destination (To:)
- d. Source (From:)
- e. Names of Contractor, subcontractor, manufacturer, and supplier
- f. Category and type of submittal
- g. Submittal purpose and description
- h. Specification Section number and title
- i. Drawing number and detail references, as appropriate
- j. Transmittal number, numbered consecutively
- k. Submittal and transmittal distribution record
- l. Remarks
- m. Signature of transmitter

F. Shop Drawings:

1. Procedures for Preparing, Forwarding, Checking and Returning all Shop Drawings shall be, generally, as follows:
 - a. The Contractor shall make available to its subcontractors the necessary Contract Documents and shall instruct such subcontractor to determine dimensions and conditions in the field, particularly with reference to coordination between the trade subcontractors. The Contractor shall direct its subcontractors to prepare Shop Drawings for submission to the Design Consultant 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:
 1. Review and be responsible to the Commissioner, for information shown on its subcontractor's Shop and Installation drawings and manufacturers' data, and also for conformity to Contract Documents.
 2. "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 and/or its subcontractor(s).
 3. Clearly designate which entity 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 Design Consultant.
 4. Stamp submissions "Recommended for Acceptance", date and forward to the Design Consultant.
2. The Contractor shall promptly prepare and submit project specific layout detail and Shop Drawings of such parts of the work as are indicated in the Specifications, Schedule F of the Addendum 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 be on sheets of the same size as the Contract Drawings, drawn accurately and of sufficient scale to be legible, 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 all aspects of the work, including without limitation 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 thickness and finishes
 - e. Identification of products
 - f. Fabrication and installation drawings
 - g. Roughing-in and setting diagrams
 - h. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring
 - i. Shop work manufacturing instructions
 - j. Templates and patterns
 - k. Schedules
 - l. Design calculations
 - m. Compliance with specified standards
 - n. Notation of coordination requirements
 - o. Notation of dimensions established by field measurement
 - p. Relationship to adjoining construction clearly indicated
 - q. Seal and signature of professional engineer if specified
 - r. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring
 - s. All other information necessary for the work and/or 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 and sequence 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
6. Field Measurements: In addition to the above requirements, the Shop Drawings shall be signed by the Contractor and, if applicable, the subcontractor responsible for preparation of the Shop Drawings. Each Shop Drawing shall be stamped with the following wording:

FIELD MEASUREMENTS: The Contractor certifies that it has verified and supplemented the Contract Drawings by taking all required field measurements, which said measurements correctly reflect all field conditions and that this Shop Drawing incorporates said measurements.
7. Contractor's Statement with Submittal: Any Submittal by the Contractor for acceptance, including without limitation, all dimensional drawings of equipment, blueprints, catalogues, models, samples and other data relative to the equipment, the materials, the work or any part thereof, must be accompanied by a statement that the Submittal has been examined by the Contractor and that everything shown in the Submittal is in accordance with the requirements of the Contract Drawings and Specifications. If there is any discrepancy between what is shown in the Submittal and the requirements of the Contract Drawings and Specifications, the Contractor shall, in its statement, list and clearly describe each such discrepancy.

Acceptance will be given based upon the Contractor's representation that what is shown in the Submittal is in accordance with the requirements of the Contract Drawings and Specifications. If



the Contractor's statement indicates any discrepancy between what is shown in the Submittal and the requirements of the Contract Drawings and Specifications, such change is subject to review and prior written acceptance by the Design Consultant. In addition, such change may require a change order in accordance with Article 25 of the Contract. In the event any such change is approved, any additional expense or increased cost in connection with the change is the sole responsibility of the Contractor.

8. Submission of Shop Drawings:

- a. Initial Submission: The Contractor shall submit seven (7) copies of each Shop Drawing to the Design Consultant for his/her review and acceptance. The Design Consultant will transmit Shop Drawings to appropriate sub-consultants for review and acceptance, including Commissioning Authority/Agent as applicable. A satisfactory Shop Drawing will be stamped "No Exceptions Taken", be dated and distributed by the Design Consultant as follows:
- 1) Two (2) copies thereof will be returned to the Contractor by letter
 - 2) Three (3) copies of the approved Shop Drawing and copy of the transmittal letter to the Contractor will be forwarded to DDC
 - 3) One copy will be retained by the Design Consultant
 - 4) One copy will be forwarded / retained by sub-consultant(s) as appropriate

Should the Shop Drawing(s) be "Rejected" or noted "Revise and Resubmit" by the Design Consultant, the Design Consultant will return the Shop Drawings to the Contractor with the necessary corrections and changes to be made as indicated thereon.

- b. Revisions: The Contractor must make such corrections and changes and again submit seven (7) copies of each shop drawing to the Design Consultant. The Contractor shall revise and resubmit the Shop Drawing as required by the Design Consultant until the Shop Drawings are stamped "No Exceptions Taken". However, Shop Drawings which have been stamped "Make Corrections Noted" shall be considered an "Acceptable" Shop Drawing and NEED NOT be resubmitted.
- c. Commencement of Work: No work or fabrication called for by the Shop Drawings shall be done until the acceptance of the said drawings by the Design Consultant is given. In addition to the foregoing Shop Drawing transmissions, a copy of any Shop Drawing prepared by any of the Contractor's subcontractors which Shop Drawing indicated work related to, adjacent to, impinging upon, or affecting work to be done by other subcontractors shall be transmitted to the subcontractors so affected. [These accepted Shop Drawings shall be distributed to the affected subcontractors when required with a copy of the transmittal to the Resident Engineer.]
- d. 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. Acceptance of the Shop Drawings shall constitute acceptance of the subject matter thereof only and not of any structural apparatus shown or indicated.

G. Product Data:

1. General: Except as otherwise prescribed herein, the submission, review and acceptance of Product Data and Catalogue cuts shall conform to the procedures specified in Sub-Section 1.6 F, Shop Drawings.
2. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
3. Mark each copy of each submittal to show which products and options are applicable.
4. Include the following information, as applicable:



- a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operation and maintenance manuals.
 - k. Compliance with specified referenced standards.
 - l. Testing by recognized testing agency.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
5. Submit Product Data before or concurrent with Samples.
6. Submission of Product Data:
- a. Initial Submission: The Contractor shall submit seven (7) sets of Product Data to the Design Consultant for his/her review and acceptance. The Design Consultant will transmit Product Data to appropriate sub-consultants for review and acceptance, including Commissioning Authority/Agent as applicable. A satisfactory catalogue cut will be stamped "No Exception Taken", be dated and distributed as follows:
 - 1) Two (2) copies thereof will be returned to the Contractor by letter
 - 2) Three (3) copies of the Product Data and copy of the transmittal letter to the Contractor will be forwarded to DDC
 - 3) One copy will be retained by the Design Consultant
 - 4) One copy will be forwarded / retained by sub-consultant(s) as appropriateShould the Product Data be "Rejected" or noted "Revise and Resubmit" by the Design Consultant, the Design Consultant will return one (1) set of such Product Data to the Contractor with the necessary corrections and changes to be made indicated and one (1) set to DDC.
7. Revisions: The Contractor must make such corrections and changes and again submit seven (7) copies of each Product Data for the review of the Design Consultant. The Contractor shall revise and resubmit the Product Data as required by the Design Consultant until the submission is stamped "No Exceptions Taken" by the Design Consultant. However, Product Data which has been stamped "Make Corrections Noted" shall be considered an "Accepted" Product Data and NEED NOT be resubmitted.
- H. Samples of Materials:
1. For samples of materials involving electrical work of any nature, refer to Section 00 35 06 - 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.
 3. Each of the samples shall be labeled as follows:
 - a. Name of the Project, DDC Project Number and Contract Number
 - b. Name and quality of the material
 - c. Date



- d. Name of Contractor, subcontractor, manufacturer and supplier
 - e. Related Specification or Contract Drawing reference to the samples submitted
4. A letter of transmittal, in triplicate, from the Contractor requesting acceptance must accompany all such samples.
 5. Transportation charges to the Design Consultant's office must be prepaid on all samples forwarded.
 6. Samples for testing purposes shall be as required in the Specifications.
 7. Samples on Display: When samples are specified to be equal to approved product, they shall be carefully examined by the Contractor and by those whom the Contractor expects to employ for the furnishing of such materials.
 8. 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 acceptance is received, in writing, from the Design Consultant. All materials shall be furnished equal in every respect to the accepted samples.
 9. The Acceptance 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 Design Consultant, 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 Design Consultant, for the project.
 10. Acceptability of test Data: The Commissioner will be the final judge as to acceptability of laboratory test data and performance in service of materials submitted.
 11. Valuable Samples: 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.
 12. Equivalent Quality: Any material, article and/or equipment which is designated in the Drawings and/or Specifications by a number in the catalogue of any manufacturer or by a manufacturer's grade or trade name is designated for the purpose of describing the material, article and/or equipment and fixing the standard of performance and/or function, as well as the quality and/or finish. Any material, article and/or equipment which is other than what is specified in the Drawings and/or Specifications will only be accepted if the Commissioner makes a written determination that such material, article and/or equipment is equivalent to that which is specified in the Drawings and/or Specifications.
 13. The submission of any material, article and/or equipment as the equal of any material, article and/or equipment set forth in the Drawings and/or Specifications as a standard shall be accompanied by any and all information essential for determining whether such proposed material, article and/or equipment is equivalent to that which is specified. Such information shall include, without limitation, illustrations, drawings, descriptions, catalogues, records of tests, samples, as well as information regarding the finish, durability and satisfactory use of such proposed material, article and/or equipment under similar operating conditions.



REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.7

1.7 LEED SUBMITTALS:

- A. Comply with submittal requirements specified in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL; Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS; Section 01 81 13.13, VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED BUILDINGS; Section 01 81 19, INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS and Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS.
- B. LEED Building submittal information shall be assembled into one package per each applicable specification section, separate from all other non-LEED submittals. Each submittal package shall have a separate transmittal and identification as described in Sub-Section 1.5 herein.
- C. Number of Copies: Submit FOUR (4) copies of LEED submittals, in accordance with procedure described in Article 1.5 herein, unless otherwise indicated.
- D. Material Safety Data Sheets (MSDSs) for LEED Certification: Submit information necessary to show compliance with LEED certification requirements, which will be the limit of the Design Consultant's review for LEED compliance.
 - 1. Designated LEED submittals that include non-LEED MSDS data will not be reviewed. The entire submittal will be returned for re-submission.
- E. Product Cut Sheets and/or Shop Drawings for LEED Certification: Provide product cut sheets and/or shop drawings with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project. For detailed requirements refer to Sub-Section 1.6 of Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED PROJECTS.
 - 1. Provide the quantity, length, area, volume, weight, and/or cost of each product submitted as required to satisfy LEED documentation requirements. Refer to Sub-Section 1.6 of Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED PROJECTS.

1.8 ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING:

- A. In accordance with Section 01 10 00 Summary, Sub-Section 1.5 E, the Contractor shall submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel and Best Available Technology (BAT) in Non road Vehicles. Submission of such reports shall be in accordance with the schedule, format, directions and procedures established by the Commissioner.

1.9 CONSTRUCTION PHOTOGRAPHS AND DVD RECORDINGS:

- A. Submit construction progress photographs and DVD recordings in accordance with requirements of Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION

1.10 AS-BUILT DOCUMENTS:

- A. Submit all as-built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.



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Issue Date - June 01, 2013
Revised - January 15, 2015

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 33 00

SUBMITTAL PROCEDURES
01 33 00 - 10



**SECTION 01 35 03
GENERAL MECHANICAL REQUIREMENTS**

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 03

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. The General Mechanical Requirements contained herein shall be followed by the Contractor, as well as its subcontractor for HVAC work. This Section sets forth the General Requirements applicable to mechanical 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 Section and the requirements of the Specifications and/or the Contract Drawings, whichever requirement is the most stringent, as determined by the Commissioner, shall take precedence.

1.3 RELATED SECTIONS: Include without limitation the following:

- A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS
D. Section 01 42 00 REFERENCES
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

- A. 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. For work on existing piping any insulation on such existing piping is to be tested for asbestos and abated, if found to be positive by a certified asbestos contractor. Such testing and abatement shall occur prior to the performance of any work on these pipes.

1.5 SUBMITTALS:

- A. INTENT OF MECHANICAL CONTRACT DRAWINGS – Mechanical 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.
- B. The Contractor shall follow these Contract Drawings in laying out the work and verify the spaces in which it will be installed. The Contractor shall submit, as directed, Mechanical Shop Drawings, roughing drawings, manufacturer's Shop Drawings, field drawings, cuts, bulletins, etc., of all materials, equipment and methods of installation shown or specified in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

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.

1.6 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.

1.7 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.

1.8 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. For work on existing piping, ducts and equipment the Contractor shall pay special attention during this task so as not to disturb the insulation on such piping, ducts or equipment.

1.9 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.

1.10 SUPPORTING STRUCTURES DESIGNED BY THE CONTRACTOR:

Unless otherwise specified, supporting structures for equipment to be furnished by the Contractor shall be designed by an Engineer licensed in New York State retained by the Contractor. Supporting structures shall be 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:

- A. Structural Steel - ASTM Standard Specifications, AISC and New York City Construction Codes.



- B. 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 New York City Construction Codes for average concrete.
- C. 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.
- D. Drawings and calculations shall be submitted for review and acceptance in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1.11 ELIMINATION OF NOISE:

- A. All systems and/or equipment provided under the Contract shall operate without objectionable noise or vibration.
- B. 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.
- C. Should noise or vibration found objectionable by the Commissioner be transmitted by any pipe or portions of the structure from systems and/or 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.

1.12 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.

1.13 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.

1.14 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 in accordance with Section 01 77 00 CLOSEOUT PROCEDURES. The work shall not be deemed substantially complete until the certificates have been delivered. See General Comments regarding problems with specifying items required for substantial completion.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 35 03



NEW YORK CITY DEPARTMENT OF
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Division 01 – DDC STANDARD GENERAL CONDITIONS
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No Text

GENERAL MECHANICAL REQUIREMENTS
01 35 03 - 4



SECTION 01 35 06
GENERAL ELECTRICAL REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section 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 Section and the requirements of the Project Specifications and/or the Contract Drawings, whichever requirement is the most stringent, as determined by the Commissioner, shall take precedence.
- B. This Section includes the following:
1. Procedure for Electrical Approval
 2. Submittals
 3. Electrical Installation Procedures
 4. Electrical Conduit System Including Boxes (Pull, Junction and Outlet)
 5. Electrical Wiring Devices
 6. Electrical Conductors and Terminations
 7. Circuit Protective Devices
 8. Distribution Centers
 9. Motors
 10. Motor Control Equipment
 11. Schedule of Electrical Equipment

1.3 RELATED SECTIONS: Include without limitation the following:

- | | | |
|----|------------------|---------------------------------|
| A. | Section 01 10 00 | SUMMARY |
| B. | Section 01 33 00 | SUBMITTAL PROCEDURES |
| C. | Section 01 35 03 | GENERAL MECHANICAL REQUIREMENTS |
| D. | Section 01 42 00 | REFERENCES |
| E. | Section 01 77 00 | CLOSEOUT PROCEDURES |
| F. | Section 01 78 39 | CONTRACT RECORD DOCUMENTS |

1.4 DEFINITIONS:

- A. **WIRING:** means both wire and raceway (rigid steel, heavy wall conduit unless specifically indicated otherwise).
- B. **POWER WIRING:** means wiring from a panel board 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.
- C. **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.

- D. **RIGID STEEL CONDUIT:** shall 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 alarms systems, as required by the New York City Construction Codes.
- E. **ELECTRICAL METALLIC TUBING (EMT):** shall mean industry standard thin wall conduit of galvanized steel only. All elbows, bends, couplings and similar fittings which are installed as a part of the conduit system shall be compatible 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.
- F. **FLEXIBLE METALLIC CONDUIT (FMC):** Shall mean a conduit made through the coiling of a self-interlocking ribbed strip of aluminum or steel, forming a hollow tube through which wires can be pulled. 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.

1.5 PROCEDURE FOR ELECTRICAL APPROVAL:

This Sub-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 the work of other trade subcontractors.

- 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. **ACCEPTANCE:** Acceptance and approval of the work will be contingent upon the inspection and test of the installation by the City regulatory agency.
- C. **TESTS:** The Contractor shall notify the Commissioner when the Contractor has completed the work and is ready to have it inspected and tested. Upon completion of the work 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 is 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.):** The Contractor must file prior to requesting a substantial completion inspection a Certificate of Inspection issued by B.E.C. On completion of the work the Contractor shall obtain certificates of inspection, approval, acceptance and compliance from all agencies and/or entities having jurisdiction over the work and shall deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES.
- 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 the Contract.



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 equipment 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 equipment, apparatus or materials of the same kind, type or classification which are intended to be used for identical types of service, shall be made by the same manufacturer.

1.6 SUBMITTALS:

A. CONTRACTOR'S ELECTRICAL DRAWINGS AND SAMPLES FOR APPROVAL:

1. The Contractor shall submit to the Commissioner for approval, in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, 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 in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, 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.

- B. **TIMELINESS:** All material shall be submitted in accordance with the submittal schedule in sufficient time for the progress 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.
- C. **CONTRACTOR'S STATEMENT WITH SUBMITTALS:** Contractor shall submit statement in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.
- D. **BULLETINS AND INSTRUCTIONS:** The Contractor shall furnish and deliver to the Commissioner in accordance with Section 01 78 39, CONTRACT RECORD DOCUMENTS and Section 01 77 00, CLOSEOUT PROCEDURES, 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 II – PRODUCTS (Not Used)



PART III – EXECUTION

3.1 ELECTRICAL INSTALLATION PROCEDURES:

This Sub-Section sets forth the General Installation Procedure that shall apply to all electrical work and electrical equipment appearing in the Contract.

(Refer to Sub-Section 1.4 DEFINITIONS for terms used in this section)

- A. **INTENT OF CONTRACT DOCUMENTS:** The Drawings and Specifications 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 the Contractor shall provide whatever labor and materials are found necessary, within the scope of the 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 DDC. 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 DDC 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 subcontractor for Plumbing Work and shall extend one (1) inch above finished floor.
- D. **COORDINATION:** The 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. The 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. **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. The 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. If any piercing of waterproofing occurs because of the installation of the work, the Contractor shall restore the waterproofing, at its own expense, to the satisfaction of the Commissioner.
- F. **ELECTRICAL WORK AT SITE:** The Contractor furnishing 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, without additional cost to the City.
- G. **COOPERATION AMONG SUBCONTRACTORS:** Whenever an electrically operated unit or system involves the combined work of several subcontractors for its installation and successful operation, the



Contractor shall require each subcontractor to exercise the utmost diligence in cooperating with others to produce a complete, harmonious installation.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2

3.2 ELECTRICAL CONDUIT SYSTEM INCLUDING BOXES (PULL, JUNCTION AND OUTLET):

This Sub-Section sets forth the requirements applying to the installation of electrical conduits, boxes or fittings. Rigid steel conduit shall be used throughout, unless otherwise directed by the Commissioner. 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.

(Refer to Sub-Section 1.4 DEFINITIONS for terms used in this section)

A. 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 New York City Electrical Code 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 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:** When installing underground conduits, duct banks or manholes the Contractor shall perform 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 Galvanized 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 the 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.
 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 using a ball mandrel and a brush and snake before the installation will be accepted. The ball shall be 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 Resident Engineer. 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 1-¼ 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 Resident Engineer and submitted in triplicate for approval. This record shall be entered on the Contract Record Drawings under Section 01 78 39, CONTRACT RECORD DOCUMENTS.
 - 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.
- B. 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 Galvanized 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 and be NEMA 4X. All pull boxes shall be suspended from ceiling or walls in the most substantial manner.
2. 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. Precaution should be exercised regarding the location of window and door trims, paneling, etc. Mistakes resulting from failure to exercise precaution must be corrected by the Contractor at no additional cost to the City. Outlets in hung ceilings shall be supported from the black iron or structure.
 3. 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.
 4. Exposed wall outlet boxes shall be erected neatly and tight against the walls and securely anchored to same.
 5. 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.
 6. **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
 7. 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.
 8. 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.
 9. 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.
 10. 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.

11. **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.
12. 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, non-corrodible and not less than four (4) in number for each box opening.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 ELECTRICAL WIRING DEVICES:

- 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, 20 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4

3.4 ELECTRICAL CONDUCTORS AND TERMINATIONS:

- 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 applicable detailed Specifications.
- 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. **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.

I. 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 manufacturer. 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 subcontractor furnishing a device containing lugs is to coordinate with the Contractor 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5

3.5 CIRCUIT PROTECTIVE DEVICES:

This Section sets forth the circuit protective devices such as circuit breakers and safety switches, used in connection with Motor Control Equipment, Distribution Centers, Panel boards 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 BARRIER: 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. 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 Specifications or indicated on the Contract Drawings.
7. 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 and 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.
8. CONSTANCY OF CALIBRATION: The tripping elements shall insure constant calibration and be capable of withstanding excessive short circuit conditions without injury.
9. CONTACTS: shall be non-welding under operating conditions and of the silver to silver type.
10. 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.
11. 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.6

3.6 DISTRIBUTION CENTERS:

This Section sets forth the construction and installation procedure for Switchboards, Panel boards and Cabinets.

- A. PANELBOARDS-GENERAL TYPE: The panel boards 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 dead front 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 panel board 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 ½



- 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:**
1. **PANEL CABINET INSTALLATION:** When installed surface mounted in panel closets they shall be mounted on Kindorf channel.
 2. 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. **NAMEPLATES:** Nameplates where required, shall be made of engraved Lamicaid 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.
- H. **SHOP DRAWINGS:** showing all details of boxes, panels, etc., shall be submitted for approval.
- I. **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, Polycarbonate 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.
- J. **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, panel boards shall be enclosed and gasketed NEMA 3R type. Panel boards located outdoors or exposed to the weather shall be NEMA 3X type.
 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.



REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.7

3.7 MOTORS:

This Section sets forth the general design, construction and performance requirements, which shall apply to all motors furnished in the Contract.

- A. **MOTOR DESIGN:** All motors shall be designed to comply with the New York State Energy Conservation Construction Code and the New York City Energy Conservation Code. In the event of any conflict or inconsistency between such codes, the New York City Energy Conservation Code shall prevail. 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 the 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. **STANDARDS OF COMPARISON:** In the absence of specific motor specifications, 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.
- C. **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 New York City Construction Codes 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.
- D. **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. The Contractor furnishing four (4) or more such motors shall also furnish, as part of the 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.
- E. **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.
- F. **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.

- G. 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.
- H. MOTORS ON LIGHTING PANELS: The largest A.C. motor permitted on branch circuits of lighting panels shall not exceed 1/4 horsepower.
- I. MOTORS RATED: 1/2 horsepower and larger shall be polyphase.

REFER TO THE APPENDIX FOR THE APPLICABILITY OF SUB SECTIONS

3.8 MOTOR CONTROL EQUIPMENT:

This Section sets forth the requirements for motor controllers and associated devices. Such requirements are applicable to all motor control equipment furnished or installed.

- A. MANUFACTURER: All control equipment furnished under the 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 furnishing motors 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 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 1/2 horsepower or more, magnetic starters and circuit breakers shall be used. Single phase A.C. motors smaller than 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 ½ 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 Article 3.5 **CIRCUIT PROTECTIVE DEVICES**. 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 Contractor's subcontractor(s) who furnish electrically operated equipment shall give to the Contractor and the Contractor's electrical subcontractor full information relative to sizes and locations of apparatus furnished by them which require electrical connections.
- I. **SPARE PARTS:**
1. **FURNISH:** The Contractor shall furnish the following spare parts pertaining to equipment furnished by each subcontractor.
- 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.

END OF SECTION 01 35 06



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

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GENERAL ELECTRICAL REQUIREMENTS
01 35 06 - 16



SECTION 01 35 26
SAFETY REQUIREMENTS PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. The Contractor shall comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements*". This document is included in the Information for Bidders.

1.2 SUMMARY:

- A. This Section includes administrative and general procedural requirements for Safety and Health Requirements, including:
 - 1. Definitions
 - 2. Required Safety Meeting
 - 3. Compliance with Regulations
 - 4. Submittals
 - 5. Personnel Protective Equipment
 - 6. Hazardous Materials
 - 7. Emergency Suspension of Work
 - 8. Protection of Personnel
 - 9. Environmental Protection

1.3 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 REQUIRED SAFETY MEETINGS:

- A. Prior to commencing construction, the Resident Engineer will schedule and hold a preconstruction kick-off meeting either at DDC's main office or at the Project site with representatives of the Contractor, including the principal on-site project representative and one or more safety representatives, Commissioner's designated representatives and other concerned parties for the purpose of reviewing the Contract Safety requirements. The Contractor's safety requirements shall be reviewed, and implementation of safety provisions pertinent to the Work shall be discussed.
- B. The Contractor is responsible for conducting weekly documented jobsite safety meetings, given to all jobsite personnel including all subcontractors on the project, with the purpose of discussing safety topics and job specific requirements at the DDC worksite.



1.5 COMPLIANCE WITH REGULATIONS:

- A. The Work, including contact with or handling of hazardous materials, disturbance or dismantling of structures containing hazardous materials, and disposal of hazardous materials, shall comply with the applicable requirement for CFR Parts 1910 and 1926, and 40 CFR, Parts 61, 261, 761 and 763.
- B. Work involving disturbance or dismantling of asbestos or asbestos containing materials, demolition of structures containing asbestos and removal of asbestos, shall comply with 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763, as applicable.
- C. Work shall additionally comply with all applicable federal, state and local safety and health regulations.
- D. In case of a conflict between applicable regulations, the more stringent requirements shall apply.
- E. All workers working on the DDC project site are required by NYC Local Law 41 to complete the OSHA 10 –hour training course.

1.6 SUBMITTALS:

- A. The Contractor shall submit, to the Resident Engineer, copies of the Safety Program, Site Safety Plan and other required documentation in accordance with the *"New York City Department of Design and Construction Safety Requirements."*
- B. Permits: If hazardous materials are disposed of off-site submit copies of shipping manifests and permits from applicable federal, state or local authorities and disposal facilities, and submit certificates that the material has been disposed of in accordance with regulations to the Resident Engineer.
- C. Accident Reporting: Submit a copy of each accident report to the Resident Engineer in accordance with the *"New York City Department of Design and Construction Safety Requirements."*
- D. All Asbestos and Lead project regulatory notifications are to be submitted to DDC's Bureau of Environmental and Geotechnical Services (BEGS) through the Resident Engineer.
- E. Request for Subcontractor Approval: Any subcontractor performing environmental work shall submit required documentation for approval to perform such work as required by DDC's BEGS.

PART II – PRODUCTS

2.1 PERSONNEL PROTECTIVE EQUIPMENT:

Special facilities, devices, equipment and similar items used by the Contractor in execution of the Work shall comply with 29 CFR Part 1910, subpart I, Part 1926, subpart E and other applicable regulations.

2.2 HAZARDOUS MATERIALS:

- A. The Contractor shall bring to the attention of the Commissioner, any material encountered during execution of the Work that the Contractor suspects to be hazardous.
- B. The Commissioner shall determine whether the Contractor shall perform tests to determine if the material is hazardous. A change to the Contract price may be provided, subject to the applicable provisions of the Contract.
- C. If the material is found to be hazardous, the Commissioner may direct the Contractor to remediate the hazard and a change to the Contract price may be provided, subject to the applicable provisions of the Contract.



PART III – EXECUTION

3.1 EMERGENCY SUSPENSION OF WORK:

- A. When the Contractor is notified by the Commissioner of noncompliance with the safety provisions of the Contract, the Contractor shall immediately, unless otherwise instructed, correct the unsafe condition, at no additional cost to the City.
- B. If the Contractor fails to comply promptly, all or part of the Work may be stopped by notice from the Commissioner.
- C. When, in the opinion of the Commissioner, the Contractor has taken satisfactory corrective action, the Commissioner shall provide written notice to the Contractor that work may resume.
- D. The Contractor shall not be allowed any extension of time or compensation for damages in connection with a work stoppage for an unsafe condition.

3.2 PROTECTION OF PERSONNEL:

- A. The Contractor shall take all necessary precautions to prevent injury to the public, occupants, or damage to property of others. The public and occupants includes all persons not employed by the Contractor or a subcontractor.
- B. Whenever practical, the work area shall be fenced, barricaded or otherwise blocked off from the Public or occupants to prevent unauthorized entry into the work area, in compliance with the requirements of Section 01 50 00, TEMPORARY FACILITIES, SERVICES AND CONTROLS, and including, without limitation, the following:
 - 1. Provide traffic barricades and traffic control signage where construction activities occur in vehicular areas.
 - 2. Corridors, aisles, stairways, doors and exit ways shall not be obstructed or used in a manner to encroach upon routes of ingress or egress utilized by the public or occupants, or to present an unsafe condition to the public or occupants.
 - 3. Store, position and use equipment, tools, materials, scraps and trash in a manner that does not present a hazard to the public or occupant by accidental shifting, ignition or other hazardous activity.
 - 4. Store and transport refuse and debris in a manner to prevent unsafe and unhealthy conditions for the public and occupants. Cover refuse containers, and remove refuse on a frequent regular basis acceptable to the Resident Engineer. Use tarpaulins or other means to prevent loose transported materials from dropping from trucks or other vehicles.

3.3 ENVIRONMENTAL PROTECTION:

- A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.
- B. Comply with applicable federal, state and local noise control laws, ordinances and regulations, including but not limited to 29 CFR 1910.95, 29 CFR 1926.52 and NYC Administrative Code Chapter 28 of Title 15.

END OF SECTION 01 35 26



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SAFETY REQUIREMENTS PROCEDURES

01 35 26 - 4



SECTION 01 35 91
HISTORIC TREATMENT PROCEDURES

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 91

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section includes administrative and procedural requirements for the treatment of Landmark Structures and Landmark Quality Structures, as identified in the Addendum. Specific requirements are indicated in other sections of the Specifications.
- B. This Section includes, without limitation, the following:
1. Storage and protection of existing historic materials
 2. Temporary protection of historic materials during construction
 3. General Protection
 4. Protection during use of heat-generating equipment
 5. Photographic Documentation
 6. NYC Landmarks Preservation Commission Final Approval signoffs

1.3 RELATED SECTIONS: include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
- C. Section 01 33 00 SUBMITTAL PROCEDURES
- D. Section 01 77 00 CLOSEOUT PROCEDURES
- E. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
- C. Landmark Structure or Site: Any building or site which has been designated as a landmark, or any building or site within a landmark district, as designated by the New York City Preservation Commission or the New York State Historic Preservation Office.



- D. **Landmark Quality Structure:** Any building which has been determined by the City to be of landmark quality and/or historical significance.
- E. **Preservation:** To apply measures necessary to sustain the existing form, integrity, and materials of a historic property. Work may include preliminary measures to protect and stabilize the property.
- F. **Rehabilitation:** To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.
- G. **Restoration:** To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and the reconstruction of missing features from the restoration period.
- H. **Reconstruction:** To reproduce in the exact form and detail a building, structure, or artifact as it appeared at a specific period in time.
- I. **Stabilize:** To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form as it exists at present.
- J. **Protect and Maintain:** To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.
- K. **Repair:** To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.
- L. **Replace:** To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:
 - 1. **Duplication:** Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
 - 2. **Replacement with New Materials:** Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
 - 3. **Replacement with Substitute Materials:** Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.
- M. **Remove:** To detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- N. **Remove and Salvage:** To detach items from existing construction and deliver them to the City ready for reuse.
- O. **Remove and Reinstall:** To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.
- P. **Existing to Remain or Retain:** Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.



- Q. Material in Kind: Material that matches existing materials, as much as possible, in species, cut, color, grain, and finish.

1.5 SUBMITTALS:

- A. Historic Treatment Program: Submit a written plan for each phase or process, including protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of work.
- B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of work, submit for Commissioner's approval a written description including evidence of successful use on other comparable projects, and program of testing to demonstrate effectiveness for use on this Project.
- C. Qualification Data: For historic treatment specialists as specified and required by individual sections of the project specifications.
- D. Photographs for Designated Landmark Structures: Submit photographs in accordance with Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION and as described in this section.
- E. Record Documents: Include modifications to manufacturer's written instructions and procedures, as documented in the historic treatment preconstruction conference and as the Work progresses.

1.6 QUALITY ASSURANCE:

- A. Special Experience Requirements: Special Experience Requirements may apply to the firm that will provide Historic Treatment Services. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.
- B. Historic Treatment Preconstruction Conference: The Resident Engineer will schedule and hold a preconstruction meeting at the site in accordance with Section 01 31 00, PROJECT MANAGEMENT AND COORDINATION.
 - 1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.
 - a. Record procedures established as a result of the review and distribute to affected parties.

1.7 STORAGE AND PROTECTION OF HISTORIC MATERIALS:

- A. Removed and Salvaged Historic Materials: As specified and required by individual sections of the project specifications.
- B. Removed and Reinstalled Historic Materials: As specified and required by individual sections of the project specifications.
- C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by the Commissioner, items may be removed to a suitable, protected storage location during historic treatment and reinstalled in their original locations after historic treatment operations are complete.
- D. Storage and Protection: When removed from their existing location, store historic materials, at a location acceptable to the Commissioner, within a weather tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Secure stored materials to protect from theft.
 - 1. Identify removed items with an inconspicuous mark indicating their original location.



PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 PROTECTION, GENERAL:

- A. Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.
- B. Ensure that supervisory personnel are present when work begins and during its progress.
- C. Temporary Protection of Historic Materials during Construction:
 - 1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.
 - 2. Attachments of temporary protection to existing construction shall be approved by the Commissioner prior to installation.
- D. Protect landscape work adjacent to or within work areas as follows:
 - 1. Provide barriers to protect tree trunks.
 - 2. Bind spreading shrubs.
 - 3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than 8 hours at a time.
 - 4. Set scaffolding and ladder legs away from plants.
- E. Existing Drains: Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. Notify Commissioner immediately of drains or systems that are stopped or blocked. Do not begin Work of this Section until the drains are in working order.
 - 1. Provide a method to prevent solids, including stone or mortar residue, from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of work performed under this Contract.
 - 2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT:

- A. No roofing work requiring the use of an open flame shall be permitted on any Landmark Structure or any Landmark Quality Structure, whose roof or wall structure is made of wood or primarily of wood.
- B. Comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:
 - 1. Obtain Commissioner's approval for operations involving use of open-flame or welding equipment. Notification shall be given for each occurrence and location of work with heat-generating equipment.
 - 2. As far as practical, use heat-generating equipment in shop areas or outside the building.
 - 3. Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed.



4. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
 5. Remove and keep the area free of combustibles, including, rubbish, paper, waste, etc., within area of operations.
 6. If combustible material cannot be removed, provide fireproof blankets to cover such materials.
 7. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.
 8. Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
 9. Inspect each location of the day's work not sooner than 30 minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.
- C. Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, shield the individual heads temporarily with guards.

3.3 PHOTOGRAPHIC DOCUMENTATION:

Photographs for Designated Landmark Structures: Show existing conditions prior to any historic treatments, including one overall photograph and two close-up photographs of all areas of work affected. Show one overall photograph and two close-up photographs of all areas of work after the successful execution of all historical treatments.

3.4 NEW YORK CITY LANDMARKS PRESERVATION COMMISSION FINAL APPROVALS SIGNOFF:

For all projects involving a Landmark Structure or Site, the Contractor, at the completion of the work, shall submit to the Commissioner, in accordance with Section 01 78 39, CONTRACT RECORD DOCUMENTS, all documentation concerning the successful execution of all historic treatments. This shall include, but not be limited to, copies of all before and after photographs of historic treatments, one copy of the Contractor's as-built drawings, copies of testing and analysis results, including cleaning, mortar analysis, pointing mortars and all other information pertaining to work performed under the New York City Landmarks Preservation Commission jurisdiction.

END OF SECTION 01 35 91



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**SECTION 01 40 00
QUALITY REQUIREMENTS**

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section includes the following:
- a. Definitions
 - b. Conflicting Requirements
 - c. Quality Assurance
 - d. Quality Control
 - e. Approval of Materials
 - f. Special Inspections (Controlled Inspection)
 - g. Inspections by Other City Agencies
 - h. Certificates of Approval
 - i. Acceptance Tests
 - j. Repair and Protection
- B. This Section includes administrative and procedural requirements for quality control to assure compliance with quality requirements specified in the Contract Documents.
- C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
- D. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
- E. Provisions of this Section do not limit requirements for the Contractor to provide quality-assurance and -control services required by the Commissioner or authorities having jurisdiction.
- F. Specific test and inspection requirements are specified in the individual sections of the Specifications.
- G. LEED: Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS."
- H. COMMISSIONING: Refer to the Addendum to identify whether this project will be Commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.



1.3 RELATED SECTIONS: Include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
- C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
- D. Section 01 33 00 SUBMITTAL PROCEDURES
- E. Section 01 77 00 CLOSEOUT PROCEDURES
- F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
- C. Commissioning: A Total Quality Assurance process that includes checking the design and installation of equipment, as well as performing functional testing of the same to confirm that the installed equipment is operating and in conformance with the Contract Documents and the City's requirements.

1.5 CONFLICTING REQUIREMENTS:

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, the Contractor shall comply with the most stringent requirement as determined by the Commissioner. The Contractor shall refer any uncertainties and/or conflicting requirements to the Commissioner for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. The Contractor shall refer any uncertainties to the Commissioner for a decision before proceeding.

1.6 QUALITY ASSURANCE:

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required. Individual Specification Sections specify additional requirements.
- B. Installer Qualifications: Special Experience Requirements may apply to the firm that will install, erect or assemble specified work required for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.
- C. Manufacturer Qualifications: Special Experience Requirements may apply to the firm that will manufacture equipment, products or systems specified for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.



- D. Fabricator Qualifications: Special Experience Requirements may apply to the firm that will fabricate material, products or systems specified for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.
- E. Professional Engineer Qualifications: A professional engineer who is licensed 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 the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- G. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by the Resident Engineer.
 - 2. Notify Resident Engineer seven (7) days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Design Consultant's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed, unless otherwise directed or indicated.

1.7 QUALITY CONTROL:

- A. City's Responsibilities: Where quality-control services are indicated as the City's responsibility in the Specifications, the City will engage a qualified testing agency to perform these services.
 - 1. COST OF TESTS BORNE BY THE CITY: Where the City directs tests 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.
 - 2. The City will furnish the Contractor with names, addresses, and telephone numbers of testing entities engaged and a description of the types of testing and inspecting they are engaged to perform.
 - 3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to the Contractor.
- B. Contractor's Responsibility: Tests and inspections not explicitly assigned to the City are the Contractor's responsibility. Unless otherwise indicated, the Contractor shall provide quality-control services as set forth in the Specifications and those required by Authorities having jurisdiction. The Contractor shall provide quality-control services required by Authorities having jurisdiction, whether specified or not.
 - 1. COST OF TESTS BORNE BY CONTRACTOR – In the case of tests which are specifically called for in the Specifications to be provided by the Contractor or tests which are required by any Authority having jurisdiction, but are not indicated as the responsibility of the City, the cost thereof shall be borne by the Contractor and shall be deemed to be included in the Contract price. The Contractor shall reimburse the City for expenditures incurred in providing tests on materials and equipment submitted by the Contractor as the equivalent of that specifically named in the Specifications and rejected for non-compliance.
 - 2. Where services are indicated as Contractor's responsibility, the Contractor shall engage a qualified testing agency to perform these quality-control services. Any testing agency engaged by the Contractor to perform quality control services is subject to prior approval by the Commissioner.



3. The Contractor shall not employ same entity engaged by the City, unless agreed to in writing by the Commissioner.
 4. The Contractor shall notify testing agencies and the Resident Engineer at least 72 hours in advance of the date and time for the performance of Work that requires testing or inspecting.
 5. Where quality-control services are indicated as Contractor's responsibility, the Contractor shall submit a certified written report, in triplicate to the Commissioner, of each quality-control service.
 6. Testing and inspecting requested by the Contractor and not required by the Contract Documents are Contractor's responsibility.
 7. The Contractor shall submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, the Contractor shall engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Results shall be submitted in writing as specified in Section 01 33 00 SUBMITTAL PROCEDURES.
- D. **Retesting/Re-inspecting:** Regardless of whether the original tests or inspections were the Contractor's responsibility, the Contractor shall provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. **Associated Services:** The Contractor shall cooperate with entities performing required tests, inspections, and similar quality-control services, and shall provide reasonable auxiliary services as requested. The Contractor shall notify the testing agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist testing entity in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing entities.
 6. Design mix proposed for use for material mixes that require control by the testing entity.
 7. Security and protection for samples and for testing and inspecting equipment at the Project site.
- F. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
 2. Coordinate and cooperate with the Commissioning Authority/Agent as applicable for start-up, inspection and functional testing in the implementation of the Commissioning Plan.
- G. **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.
- H. **Inspection of Material:** In the event that the Specifications require the Contractor to engage the services of an entity to witness and inspect any material especially manufactured or prepared for use in or part of the permanent construction, such entity shall be subject to prior written approval by the Commissioner.
1. **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.

- I. **No Shipping Before Inspection:** The Contractor shall comply with the foregoing before shipping any material.
- J. **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.
- K. **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.
- L. **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.
- M. **Reports:** Six (6) copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Commissioner as a prerequisite for the acceptance of any material or equipment.
- N. **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 at no additional cost to the City.
- O. **Furnish Designated Materials:** 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.

1.8 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 New York City Construction Codes, 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. No manufacturer will be approved for any materials to be furnished under the Contract unless it shall have a plant of ample capacity and shall have successfully produced similar products. All approvals of materials or equipment that are legally required by the New York City Construction Codes and other governing Authorities must be obtained prior to installation.
- C. **All Materials:** Fixtures, fittings, supplies and equipment furnished under the Contract shall be new and unused, except as approved by the Commissioner, 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.
- D. **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.

1.9 SPECIAL INSPECTIONS:

A. SPECIAL INSPECTIONS:

1. Inspection of selected materials, equipment, installation, fabrication, erection or placement of components and connections made during the progress of the Work to ensure compliance with the Contract Documents and provisions of the New York City Construction Codes, shall be made by a Special Inspector. The City of New York will retain the services of the Special Inspector and bear the costs for the performance of Special Inspections in compliance with NYC Construction Codes requirements or as additionally may be called for in the project specifications, except as noted below for Form TR-3: Technical Report for Concrete Design Mix. The Special Inspector shall be an entity compliant with the requirements of the New York City Construction Codes. The Contractor shall notify the relevant Special Inspector in writing at least 72 hours before the commencement of any work requiring special inspection.
2. Form TR3: Technical Report Concrete Design Mix: The contractor shall be responsible for, and bear all costs associated with the filing and securing of approvals, if any, for Form TR3: Technical Report Concrete Design Mix, including, but not limited to, engaging the services of a New York City licensed Concrete Testing Lab for the review and approval of concrete design mix, testing, signatures and professional seals, etc., compliant with NYC Department of Buildings requirements, for each concrete design mix.
3. The Contractor shall notify the relevant Special Inspector in writing at least 72 hours before the commencement of any work requiring Special Inspection. The contractor shall be responsible for, and bear related costs to assure that all construction or work shall remain accessible and exposed for inspection purposes until the required inspection is completed.
4. Inspections and tests performed under "Special Inspection" shall not relieve the Contractor of the responsibility to comply with the Contract Documents, and that there is no warranty given to the Contractor by the City of New York in connection with such inspection and tests or certifications made under "Special Inspections".
5. The contractor must coordinate with the Resident Engineer or DDC Project Manager to provide access and schedule the work for inspection by the Special Inspector.

1.10 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, the Contractor will be required to arrange for all final inspections by the inspection staff of the Department of Buildings, Fire Department 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.

1.11 CERTIFICATES OF APPROVAL:

- A. Responsibility: The Contractor shall be responsible for and shall obtain all final approvals for the work installed under the 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.



1.12 ACCEPTANCE TESTS:

- A. Government Agencies: All equipment and appliances furnished and installed under the Contract shall conform to 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 Tests: 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 Special 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, re-inspecting, replacing of material and/or damage to the work and any delay caused to the schedule shall be borne by the Contractor.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, the Contractor shall repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

END OF SECTION 01 40 00



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QUALITY REQUIREMENTS

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**SECTION 01 42 00
REFERENCES**

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 DEFINITIONS:

REFER TO THE ADDENDUM Article 10 FOR ADDITIONAL DEFINITIONS AND REVISIONS TO THE CONTRACT AND SPECIFICATIONS

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. "APPROVED," ETC. - "Approved," "acceptable," "satisfactory," and words of similar import shall mean and intend approved, acceptable or satisfactory to the Commissioner.
- C. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
- D. "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.
- E. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings.



1.3 CODES, AGENCIES AND REGULATIONS:

| | |
|----------------|--|
| A.D.A.A.G. | Americans with Disabilities Act (ADA) – Architectural Barriers Act (ABA) |
| B.G. & E. | Bureau of Gas and Electricity of the City of New York |
| B.S. & A. | New York City Board of Standards and Appeals |
| DOE | Department of Energy |
| E.C.C.C.N.Y.S. | Energy Conservation Construction Code of New York State |
| EPA | Environmental Protection Administration |
| N.Y.C.C.C. | New York City Construction Codes – includes:
New York City Plumbing Code
New York City Building Code
New York City Mechanical Code
New York City Fuel Gas Code |
| N.Y.S.D.O.L | New York State Department of Labor |
| N.Y.C.D.E.P | New York City Department of Environmental Protection |
| N.Y.C.E.C. | New York City Electrical Code |
| N.Y.C.E.C.C | New York City Energy Conservation Code |
| N.Y.C.F.C | New York City Fire Code |
| N.Y.S...D.E.C. | New York State Department of Environmental Conservation |
| O.S.H.A. | Occupational Safety & Health Administration |

1.4 INDUSTRY STANDARDS:

- A. STANDARD REFERENCES – Unless otherwise specifically indicated in the Contract Documents, whenever reference is made to the furnishing of materials or testing thereof that conforms to the standards of any technical society, organization or body, it shall be construed to mean the latest standard, code, specification adopted and published by that technical society, organization or body, as of the date of the bid opening, Unless the provisions of the New York City Construction Codes adopts a different or earlier dated version of such standard.
- B. APPLICABILITY OF STANDARDS: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect, to the extent referenced, as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.
- C. CONFLICTING REQUIREMENTS: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantity or quality, comply with the most stringent requirements. Immediately refer uncertainties, and requirements that are different but apparently equal, to the Commissioner in writing for a decision before proceeding.
- D. 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.
- E. REFERENCES - Reference to a technical society, organization or body may be made in the Specifications by abbreviations. Abbreviations and acronyms used in the Specifications and other Contract Documents mean the associated name. The following names are subject to change and are



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believed, but are not assured, to be accurate and up-to-date as of the Issue Date of the Contract Documents.

| | |
|--------|---|
| AA | Aluminum Association, Inc. (The) |
| AAADM | American Association of Automatic Door Manufacturers |
| AABC | Associated Air Balance Council |
| AAMA | American Architectural Manufacturers Association |
| AASHTO | American Association of State Highway and Transportation Officials |
| AATCC | American Association of Textile Chemists and Colorists (The) |
| ABAA | Air Barrier Association of America |
| ABMA | American Bearing Manufacturers Association |
| ACI | ACI International (American Concrete Institute) |
| ACPA | American Concrete Pipe Association |
| AEIC | Association of Edison Illuminating Companies, Inc. (The) |
| AF&PA | American Forest & Paper Association |
| AGA | American Gas Association |
| AGC | Associated General Contractors of America (The) |
| AGMA | American Gear Manufacturer Association |
| AHA | American Hardboard Association (Now part of CPA) |
| AHAM | Association of Home Appliance Manufacturers |
| AI | Asphalt Institute |
| AIA | American Institute of Architects (The) |
| AIEE | American Institute of Electrical Engineers |
| AISC | American Institute of Steel Construction |
| AISI | American Iron and Steel Institute |
| AITC | American Institute of Timber Construction |
| ALCA | Associated Landscape Contractors of America
(Now PLANET - Professional Landcare Network) |



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| ALSc | American Lumber Standard Committee, Incorporated |
| ALI | Automotive Lift Institute |
| AMCA | Air Movement and Control Association International, Inc. |
| ANSI | American National Standards Institute |
| AOSA | Association of Official Seed Analysts, Inc. |
| APA | APA - The Engineered Wood Association |
| APA | Architectural Precast Association |
| API | American Petroleum Institute |
| ARI | Air-Conditioning & Refrigeration Institute |
| ARMA | Asphalt Roofing Manufacturers Association |
| ASA | American Standards Association |
| ASAE | American Society of Agricultural Engineers |
| ASCE/SEI | American Society of Civil Engineers, Structural Engineering Institute |
| ASHRAE | American Society of Heating, Refrigerating and Air-Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASSE | American Society of Sanitary Engineering |
| ASTM | ASTM International
(American Society for Testing and Materials International) |
| AWCI | AWCI International
(Association of the Wall and Ceiling Industry International) |
| AWCMA | American Window Covering Manufacturers Association (Now WCSC) |
| AWI | Architectural Woodwork Institute |
| AWPA | American Wood-Preservers' Association |
| AWSC | American Welding Society |
| AWWA | American Water Works Association |
| BHMA | Builders Hardware Manufacturers Association |
| BIA | Brick Industry Association (The) |



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| | |
|-------|---|
| BICSI | BICSI |
| BIFMA | BIFMA International
(Business and Institutional Furniture Manufacturer's Association
International) |
| BISSC | Baking Industry Sanitation Standards Committee |
| CIBSE | Chartered Institute of Building Services Engineers |
| CCC | Carpet Cushion Council |
| CDA | Copper Development Association |
| CEA | Canadian Electricity Association |
| CFFA | Chemical Fabrics & Film Association, Inc. |
| CGA | Compressed Gas Association |
| CGSB | Canadian General Standards Board |
| CIMA | Cellulose Insulation Manufacturers Association |
| CIPRA | Cast Iron Pipe Research Association |
| CISCA | Ceilings & Interior Systems Construction Association |
| CISPI | Cast Iron Soil Pipe Institute |
| CLFMI | Chain Link Fence Manufacturers Institute |
| CPA | Composite Panel Association |
| CPPA | Corrugated Polyethylene Pipe Association |
| CPSC | Consumer Product Safety Commission |
| CRI | Carpet & Rug Institute (The) |
| CRSI | Concrete Reinforcing Steel Institute |
| CSA | Canadian Standards Association |
| CSI | Cast Stone Institute |
| CSI | Construction Specifications Institute (The) |
| CSSB | Cedar Shake & Shingle Bureau |
| CTI | Cooling Technology Institute (Formerly: Cooling Tower Institute) |

REFERENCES
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| DASMA | Door and Access Systems Manufacturer's Association International |
| DHI | Door and Hardware Institute |
| DOC | U.S. Department of Commerce – National Institute of Standards and Technology |
| EIA | Electronic Industries Alliance |
| DOJ | U.S. department of Justice |
| EIMA | EIFS Industry Members Association |
| DOL | U.S. Department of labor |
| EJCDC | Engineers Joint Contract Documents Committee |
| DOTn | U.S. Department of Transportation |
| EN | European Committee of Standards |
| EJMA | Expansion Joint Manufacturers Association, Inc. |
| ESD | ESD Association |
| EVO | Efficiency Valuation Organization |
| FEMA | Federal Emergency Management Agency |
| FIBA | Federation Internationale de Basketball Amateur
(The International Basketball Federation) |
| FIVB | Federation Internationale de Volleyball
(The International Volleyball Federation) |
| FMG | FM Global (Formerly: FM - Factory Mutual System) |
| FMRC | Factory Mutual Research (Now FMG) |
| FRSA | Florida Roofing, Sheet Metal & Air Conditioning Contractors Association,
Inc. |
| FSA | Fluid Sealing Association |
| FSC | Forest Stewardship Council |
| GA | Gypsum Association |
| GANA | Glass Association of North America |
| GRI | (Now GSI) |
| GS | Green Seal |
| GSI | Geosynthetic Institute |



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| | |
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| HI | Hydraulic Institute |
| HI | Hydronics Institute |
| HMMA | Hollow Metal Manufacturers Association (Part of NAAMM) |
| HPVA | Hardwood Plywood & Veneer Association |
| HPW | H. P. White Laboratory, Inc. |
| HUD | U.S. Department of Housing and Urban Development |
| IAPMO | International Association of Plumbing and Mechanical Officials |
| IAS | International Approval Services (Now CSA International) |
| IBF | International Badminton Federation |
| ICC | International Code Council, Inc. |
| ICEA | Insulated Cable Engineers Association, Inc. |
| ICRI | International Concrete Repair Institute, Inc. |
| IEC | International Electrotechnical Commission |
| IEEE | Institute of Electrical and Electronics Engineers, Inc. (The) |
| IESNA | Illuminating Engineering Society of North America |
| IEST | Institute of Environmental Sciences and Technology |
| IGCC | Insulating Glass Certification Council |
| IGMA | Insulating Glass Manufacturers Alliance |
| ILI | Indiana Limestone Institute of America, Inc. |
| ISO | International Organization for Standardization |
| ISSFA | International Solid Surface Fabricators Association |
| ITS | Intertek |
| ITU | International Telecommunication Union |
| KCMA | Kitchen Cabinet Manufacturers Association |
| LMA | Laminating Materials Association (Now part of CPA) |
| LPI | Lightning Protection Institute |
| MBMA | Metal Building Manufacturers Association |

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| MFMA | Maple Flooring Manufacturers Association, Inc. |
| MFMA | Metal Framing Manufacturers Association |
| MH | Material Handling (Now MHIA) |
| MHIA | Material Handling Industry of America |
| MIA | Marble Institute of America |
| MPI | Master Painters Institute |
| MSS | Manufacturers Standardization Society of The Valve and Fittings Industry Inc. |
| NAAMM | National Association of Architectural Metal Manufacturers |
| NACE | NACE International
(National Association of Corrosion Engineers International) |
| NADCA | National Air Duct Cleaners Association |
| NAGWS | National Association for Girls and Women in Sport |
| NAIMA | North American Insulation Manufacturers Association |
| NBGQA | National Building Granite Quarries Association, Inc. |
| NCAA | National Collegiate Athletic Association (The) |
| NCMA | National Concrete Masonry Association |
| NCPI | National Clay Pipe Institute |
| NCTA | National Cable & Telecommunications Association |
| NEBB | National Environmental Balancing Bureau |
| NECA | National Electrical Contractors Association |
| NeLMA | Northeastern Lumber Manufacturers' Association |
| NEMA | National Electrical Manufacturers Association |
| NETA | InterNational Electrical Testing Association |
| NFHS | National Federation of State High School Associations |
| NFPA | NFPA (National Fire Protection Association) |
| NFRC | National Fenestration Rating Council |

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| | |
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| NGA | National Glass Association |
| NHLA | National Hardwood Lumber Association |
| NLGA | National Lumber Grades Authority |
| NIS | National Institute of Standards and Technology |
| NOFMA | NOFMA: The Wood Flooring Manufacturers Association
(Formerly: National Oak Flooring Manufacturers Association) |
| NRCA | National Roofing Contractors Association |
| NRMCA | National Ready Mixed Concrete Association |
| NSF | NSF International (National Sanitation Foundation International) |
| NSSGA | National Stone, Sand & Gravel Association |
| NTMA | National Terrazzo & Mosaic Association, Inc. (The) |
| NTRMA | National Tile Roofing Manufacturers Association (Now TRI) |
| NWWDA | National Wood Window and Door Association (Now WDMA) |
| OPL | Omega Point Laboratories, Inc. (Acquired by ITS - Intertek) |
| PCI | Precast / Pre-stressed Concrete Institute |
| PDCA | Painting & Decorating Contractors of America |
| PDI | Plumbing & Drainage Institute |
| PGI | PVC Geomembrane Institute |
| PLANET | Professional Landcare Network
(Formerly: ACLA - Associated Landscape Contractors of America) |
| PPS | Power Piping Society |
| PTI | Post-Tensioning Institute |
| RCSC | Research Council on Structural Connections |
| RFCI | Resilient Floor Covering Institute |
| RIS | Redwood Inspection Service |
| RMI | Rack Manufacturers Institute |
| RTI | (Formerly: NTRMA - National Tile Roofing Manufacturers Association)
(Now TRI) |

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Issue Date - June 01, 2013
Revised - January 15, 2015

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| SAE | SAE International |
| SCAQMD | South Coast Air Quality Management District |
| SCS | Scientific Certification System |
| SDI | Steel Deck Institute |
| SDI | Steel Door Institute |
| SEFA | Scientific Equipment and Furniture Association |
| SGCC | Safety Glazing Certification Council |
| SHBI | Steel Heating Boiler Institute |
| SIA | Security Industry Association |
| SIGMA | Sealed Insulating Glass Manufacturers Association (Now IGMA) |
| SJI | Steel Joist Institute |
| SMA | Screen Manufacturers Association |
| SMACNA | Sheet Metal and Air Conditioning Contractors' National Association |
| SMPTE | Society of Motion Picture and Television Engineers |
| SPFA | Spray Polyurethane Foam Alliance
(Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) |
| SPIB | Southern Pine Inspection Bureau (The) |
| SPRI | Single Ply Roofing Industry |
| SSINA | Specialty Steel Industry of North America |
| SSPC | SSPC: The Society for Protective Coatings |
| STI | Steel Tank Institute |
| SWI | Steel Window Institute |
| SWRI | Sealant, Waterproofing, & Restoration Institute |
| TCA | Tile Council of America, Inc. |
| TIA/EIA | Telecommunications Industry Association/Electronic Industries Alliance |
| TMS | The Masonry Society |

REFERENCES
01 42 00 -10



NEW YORK CITY DEPARTMENT OF
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| TPI | Truss Plate Institute, Inc. |
| TPI | Turfgrass Producers International |
| TRI | Tile Roofing Institute (Formerly: RTI - Roof Tile Institute) |
| UL | Underwriters Laboratories Inc. |
| ULC | Underwriters Laboratories of Canada |
| UNI | Uni-Bell PVC Pipe Association |
| USAV | USA Volleyball |
| USC | United States Code |
| USGBC | U.S. Green Building Council |
| USITT | United States Institute for Theatre Technology, Inc. |
| WASTEC | Waste Equipment Technology Association |
| WCLIB | West Coast Lumber Inspection Bureau |
| WCMA | Window Covering Manufacturers Association (Now WCSC) |
| WCSC | Window Covering Safety Council
(Formerly: WCMA - Window Covering Manufacturers Association) |
| WDMA | Window & Door Manufacturers Association
(Formerly: NWWDA - National Wood Window and Door Association) |
| WI | Woodwork Institute (Formerly: WIC - Woodwork Institute of California) |
| WIC | Woodwork Institute of California (Now WI) |
| WMMPA | Wood Moulding & Millwork Producers Association |
| WRI | Wire Reinforcement Institute, Inc. |
| USEPA | United States Environmental Protection Agency |
| WSRCA | Western States Roofing Contractors Association |
| WWPA | Western Wood Products Association |

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 42 00

REFERENCES
01 42 00 -11



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SINGLE CONTRACT PROJECTS

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No Text

REFERENCES
01 42 00 -12



**SECTION 01 50 00
TEMPORARY FACILITIES, SERVICES AND CONTROLS**

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This section includes the following:
- a. Temporary Water System
 - b. Temporary Sanitary Facilities
 - c. Temporary Electric Power, Temporary Lighting System, And Site Security Lighting
 - d. Temporary Heat
 - e. Dewatering Facilities And Drains
 - f. Temporary Field Office for Contractor
 - g. Resident Engineer's Office
 - h. Material Sheds
 - i. Temporary Enclosures
 - j. Temporary Partitions
 - k. Temporary Fire Protection
 - l. Work Fence Enclosure
 - m. Rodent and Insect Control
 - n. Plant Pest Control Requirements
 - o. Project Identification Signage
 - p. Security Guards/Fire Guards on Site
 - q. Project Sign and Rendering
 - r. Safety

1.3 RELATED SECTIONS: include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 42 00 REFERENCES
- C. Section 01 54 11 TEMPORARY ELEVATORS AND HOISTS
- D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING
- E. Section 01 77 00 CLOSE OUT PROCEDURES

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Permanent Enclosure: As determined by Commissioner, permanent or temporary roofing that is complete, insulated, and weather tight; exterior walls which are insulated and weather tight; and all openings that are closed with permanent construction or substantial temporary closures.

- C. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Reports: Submit reports of tests, inspections, meter readings and similar procedures for temporary use.

1.6 PROJECT CONDITIONS:

- A. Temporary Use of Permanent Facilities and Services: The Contractor shall be responsible for the operation, maintenance, and protection of each permanent facility and service during its use as a construction facility before Final Acceptance by the City, regardless of previously assigned responsibilities.
- B. Install, operate, maintain and protect temporary facilities, services and controls.
1. Keep temporary services and facilities clean and neat in appearance.
 2. Operate temporary services in a safe and efficient manner.
 3. Relocate temporary services and facilities as needed as Work progresses.
 4. Do not overload temporary services and facilities or permit them to interfere with progress.
 5. Provide necessary fire prevention measures.
 6. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on-site.

1.7 NON-REGULAR WORK HOURS (OVERTIME):

- A. The Contractor shall provide the temporary services, facilities and controls set forth in this Section during other than regular working hours if the Drawings and/or the Specifications indicate that the Work, or specific components thereof, must be performed during other than regular working hours. In such case, all costs for the provision of temporary services, facilities and controls during other than regular working hours shall be deemed included in the total Contract Price.
- B. The Contractor shall provide the temporary services, facilities and controls set forth in this Section during other than regular working hours if a change order is issued directing the Contractor to perform the Work, or specific components thereof, during other than regular working hours. In such case, compensation for the provision of temporary services, facilities and controls during other than regular working hours shall be provided through the change order.

1.8 SERVICES BEYOND COMPLETION DATE:

- A. The Contractor shall provide the temporary services, facilities and controls set forth in this Section until the date on which it completes all required work at the site, including all punch list work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor shall provide such temporary services, facilities and controls even if completion of all required work at the site occurs after the time fixed for such completion in Schedule A.



PART II – PRODUCTS

2.1 MATERIALS:

- A. Provide undamaged materials in serviceable condition and suitable for use intended.
- B. Tarpaulins: Waterproof, fire-resistant UL labeled with flame spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- C. Water: Potable and in compliance with requirements of the Department of Environmental Protection.

2.2 EQUIPMENT:

- A. Provide undamaged equipment in serviceable condition and suitable for use intended.
- B. Water Hoses: Heavy-duty abrasive-resistant flexible rubber hoses, 100 feet (30 m) long with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
- C. Electric Power Cords: Grounded extension cords.
 - 1. Provide hard-service cords where exposed to abrasion or traffic.
 - 2. Provide waterproof connectors to connect separate lengths of electric cords where single lengths will not reach areas of construction activity.
 - 3. Do not exceed safe length-voltage ratio.
- D. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART III – EXECUTION:

3.1 INSTALLATION, GENERAL:

- A. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities as approved by the Resident Engineer.

3.2 TEMPORARY WATER SYSTEM:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2 A

- A. TEMPORARY WATER SYSTEM - NEW FACILITIES: During construction, the Contractor shall furnish a Temporary Water System as set forth below.
 - 1. Immediately after the Commissioner has issued an order to start work, the Contractor shall file an application with the Dept. of Environmental Protection for the schedule of charges for water use during construction. The Contractor will be responsible for payment of water charges.
 - 2. Immediately after the Commissioner has issued an order to start work, the Contractor shall file an application with the Department of Environmental Protection's Bureau of Water Supply and obtain a permit to install the temporary water supply system. The system shall be installed and maintained for the use of the Contractor and its subcontractors. A copy of the above mentioned permit shall be filed with the Commissioner. The Contractor 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 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 shall take the necessary precautions to prevent the temporary water system from freezing. The Contractor shall provide repairs to the temporary water supply system for the duration of the project until said temporary system is dismantled and removed.

3. Disposition of Temporary Water System: The Contractor shall be responsible for dismantling the temporary water system when no longer required for the construction operations, or when replaced by the permanent water system installed for the project, or as otherwise directed by the Resident Engineer. All repair work resulting from the dismantling of the temporary water system shall be the responsibility of the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2 B

B. TEMPORARY WATER SYSTEM – PROJECTS IN EXISTING FACILITIES:

1. When approved by the Commissioner, use of existing water system will be permitted for temporary water service during construction, as long as the system is cleaned and maintained in a condition acceptable to the Commissioner. At Substantial Completion, the Contractor shall restore the existing water system to conditions existing before initial use.
2. The Contractor shall be responsible for all repairs to the existing water system permitted to be used for temporary water service during construction. The Contractor shall be responsible to maintain the existing system in a clean condition on a daily basis, acceptable to the Commissioner.
3. The Contractor will be responsible for payment of water charges as directed by the Commissioner. Billing will be in accordance with the Department of Environmental Protection schedule of charges for Building Purposes.

C. WASH FACILITIES: The Contractor shall install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition.

1. Dispose of drainage properly.
2. Supply cleaning compounds appropriate for each condition.
3. Include safety showers, eyewash fountains and similar facilities for the convenience, safety and sanitation of personnel.

D. DRINKING WATER FACILITIES: The Contractor shall provide drinking water fountains or containerized tap-dispenser bottled-drinking water units, complete with paper cup supplies. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg. F (7 to 13 deg. C).

3.3 TEMPORARY SANITARY FACILITIES:

- A. The Contractor shall provide toilets, wash facilities and drinking water fixtures in compliance with regulations and health codes for type, number, location, operation and maintenance of fixtures and facilities. Provide toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility, and provide covered waste containers for used materials.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3 B

B. SELF-CONTAINED TOILET UNITS:

1. The Contractor shall provide temporary single-occupant toilet units of the chemical, aerated recirculation, or combustion type for use by all construction personnel. Units shall be properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. Quantity of toilet units shall comply with the latest OSHA regulations.
2. Toilets: Install separate self-contained toilet units for male and female personnel. Shield toilets to ensure privacy.



REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3 C

C. EXISTING TOILETS:

1. **TOILET FACILITIES:** When approved by the Commissioner, the Contractor shall arrange for the use of existing toilet facilities by all personnel during the execution of the work. The Contractor shall be responsible to clean and maintain facilities in a condition acceptable to the Resident Engineer and, at completion of construction, to restore facilities to their condition at the time of initial use.
2. **MAINTENANCE** - The Contractor shall maintain the temporary toilet facilities in a clean and sanitary manner and make all necessary repairs.
3. **NUISANCES** - The Contractor shall not cause any sanitary nuisance to be committed by its employees or the employees of its subcontractors in or about the work, and shall enforce all sanitary regulations of the City and State Health Authorities.

3.4 TEMPORARY ELECTRIC POWER, TEMPORARY LIGHTING SYSTEM, AND SITE SECURITY LIGHTING:

- A. **SCOPE:** This Section sets forth the General Conditions and procedures relating to Temporary Electric Power, Temporary Lighting System and Site Security Lighting during the construction period.

B. **TEMPORARY ELECTRIC POWER:**

The Contractor shall provide and maintain a Temporary Electric Power service and distribution system of sufficient size, capacity and power characteristics required for construction operations for all required work by the Contractor and its subcontractors, including but not limited to power for the Temporary Lighting System, Site Security Lighting, construction equipment, hoists, temporary elevators and all field offices. Temporary Electric Power shall be provided as follows:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (1)

1. **CONNECTION TO UTILITY LINES:**

- a. **Temporary Electric Power Service** for use during construction shall be provided as follows: The Contractor shall make all necessary arrangements with the Public Utility Company and pay all charges for the Temporary Electric Power system. The Contractor shall include in its total Contract Price any charges for Temporary Electric Power, including charges that may be made by the Public Utility Company for extending its electrical facilities, and for making final connections. The Contractor shall make payment directly to the Public Utility Company.
- b. **APPLICATIONS FOR METER:** The Contractor 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 Electric Power. The Contractor shall pay to the Public Utility Company, all bills for Temporary Electric energy used throughout the work, as they become due.
- c. **SERVICE AND METERING EQUIPMENT** - The Contractor shall furnish and install, at a suitable location on the site, approved service and metering equipment for the Temporary Electric Power 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 all construction operations and shall meet all requirements of the NYCEC.



REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B

2. CONNECTION TO EXISTING ELECTRICAL POWER SERVICE:

- a. When approved by the Commissioner, electrical power service for the Temporary Lighting System and for the operation of small tools and equipment less than ¼ horsepower may be taken from the existing electric distribution system if the existing system is of adequate capacity for the temporary power load. The Contractor shall cooperate and coordinate with the facility custodian, so as not to interfere with the normal operation of the facility.
- b. There will be no charge to the Contractor for the electrical energy consumed.
- c. The Contractor shall provide, maintain and pay all costs for separate temporary electric power for any temporary power for equipment larger than 1/4 horsepower. When directed by the Commissioner, the Contractor shall remove its own temporary power system.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B

3. ELECTRICAL GENERATOR POWER SERVICE:

- a. When connection to Utility Lines or existing facility electric service is not available or is not adequate to supply the electric power need for construction operations, the Contractor shall provide self-contained generators to provide power beyond that available.
- b. Pay for all energy consumed in the progress of the Work, exclusive of that available from the existing facility or Utility Company.
- c. Provide for control of noise from the generators.
- d. Comply with the Ultra Low Sulfur Fuel in Non-Road Vehicles requirements as set forth in Article 5.4 of the Contract.

C. 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 shall have the temporary lighting and power system changed over from the temporary service points to the main distribution panel.
2. **COST OF CHANGE OVER -** The Contractor shall be responsible for all costs 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 electric power service specified herein shall be adhered to after change over of service until final acceptance of the project.
4. **NO EXTRA COST -** The operation of the service and switchboard equipment shall be under the supervision of the Contractor, 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 D

D. TEMPORARY LIGHTING SYSTEM:

1. The Contractor 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
2. The Contractor shall furnish and connect to the metered service point, a Temporary Lighting System 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.
 3. **ITEMS:** The Temporary Lighting System provided by the Contractor 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, pigtails 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.
 4. The Temporary Lighting System shall be progressively installed as required for the advancement of the work under the Contract.
 5. **RELOCATION:** The cost for the relocation or extension of the original Temporary Lighting System, required by the Contractor or its subcontractors, that is not required due to the normal advancement of the work, as determined by the Resident Engineer, shall be borne by the Contractor.
 6. **PIGTAILS:** shall be furnished with left-hand sockets with locked type guards and 40 feet of rubber covered cable. The Contractor shall furnish and distribute a minimum of three (3) complete pigtails to each subcontractor. See the detailed Electrical Specifications for possible additional pigtails required.
 7. **LAMPS:** The Contractor shall furnish and install one (1) complete set of lamps, including those for the trailers. Broken and burned out lamps in the temporary lighting system, DDC field office and construction trailers, shall be replaced by the Contractor. All lamps shall be compact fluorescent.
 8. **CIRCUIT PROTECTION:** The Contractor shall furnish and install GFI protection for the Temporary Lighting and Site Security Lighting Systems.
 9. **MAINTENANCE OF TEMPORARY LIGHTING SYSTEM:**
 - a. The Contractor shall maintain the Temporary Lighting System in good working order during the scheduled hours established.
 - b. The Contractor shall include in its total Contract Price all costs in connection with the Temporary Lighting System, including all costs for installation, maintenance and electric power.
 10. **REMOVAL OF TEMPORARY LIGHTING SYSTEM:** The temporary lighting system shall be removed by the Contractor when authorized by the Commissioner.
 11. **HAND TOOLS:** The temporary lighting system shall not be used for power purposes, except that light hand tools not larger than 1/4 horsepower may be operated from such system by the Contractor and its subcontractors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 E

- E. **SITE SECURITY LIGHTING (FOR NEW CONSTRUCTION ONLY):**
1. The Contractor 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. All costs in connection with site security lighting shall be deemed included in the total Contract Price.
 2. It is essential that the site security lighting system be completely installed and operating, at the earliest possible date. The Contractor shall direct its subcontractors to 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, if a part of the system interferes with the work of any trade, the Contractor 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.
 5. The site security lighting shall be kept illuminated at all times during the hours of darkness. The Contractor shall, at its own expense, shall keep the system in operation, and shall furnish and install all material necessary to replace all damaged or burned out parts.
 6. The Contractor 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 and shall be removed and disposed of by the Contractor when authorized in writing by the Resident Engineer.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5

3.5 TEMPORARY HEAT:

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 Sub-Section 3.5 C herein.
 - 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 Fire Watch 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's responsibility for the provision of Temporary Heat, including 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 Sub-Section 3.5 B; the Contractor shall be responsible for the provision of Temporary Heat.
 - 2) Post Enclosure - Once the Commissioner determines that the building, or any portion thereof, has been enclosed, as set forth in Sub-Section 3.5 B, the Contractor 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).
 - 3) The Contractor 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 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 provided for herein is subject to the exception set forth in Sub-Section 3.5 A.2 (b) herein.
- 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 shall be responsible for the provision of Temporary Heat, except as otherwise provided in Sub-Section 3.5 H.3(b).2 herein.
 - 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 Sub-Section 3.5 H.3 (b).1 herein, determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor shall be responsible for the provision of Temporary Heat and shall be paid for the same in accordance with Sub-Section 3.5 H.3 (b).1 herein.
- B. ENCLOSURE OF STRUCTURES:
1. Notification: The Contractor shall notify all its subcontractors 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 Sub-Section 3.5 A.2 above, once the building has been enclosed, the Contractor 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 as described 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 and such work shall be deemed included in the Contract 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 shall be required to provide Temporary Heat until the date on which it completes all required work at the site, including all punch list work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor 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 shall include in its Total Contract 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 Addendum. 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 the New York City Fire Code and 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.



include such allowance amount in its Total Contract Price. The Contractor 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 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 the Commissioner determines that there is a need for maintenance of the permanent heating system by the Contractor after written acceptance by the Commissioner of the work, and that the need for such maintenance is not the fault of the Contractor, the Contractor 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 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 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 must present original invoices for the same. DDC reserves the right to furnish the required fuel.

I. RELATED ELECTRICAL WORK:

1. The Contractor shall be responsible for providing the items set forth below and shall include all expenses in connection with such items in its Total Contract Price. The Contractor shall provide such items promptly when required and shall in all respects coordinate its work with the work performed by trade subcontractors in order to facilitate the provision of Temporary Heat.
 - a. The Contractor 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 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. Such power shall be provided by the Contractor for the duration the Contractor is required to provide Temporary Heat, as set forth in Sub-section 3.5 D herein.
2. In providing the items set forth in Paragraph 1 above, the Contractor 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. RELATED PLUMBING WORK:

1. The Contractor 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 this Contract. The Contractor shall include all expenses in connection with such items of work in its Total Contract Price. The Contractor shall provide such items of work promptly when required and shall in all respects coordinate its work with the work performed by trade subcontractors in order to facilitate the provision of Temporary Heat.
2. In the event portions of the permanent plumbing equipment furnished by the Contractor as part of the work of this Contract are used for the provision of Temporary Heat either during construction or prior to acceptance by the City of the complete plumbing system, the Contractor 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 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).

3.6 STORM WATER CONTROL, DEWATERING FACILITIES AND DRAINS:

A. PUMPING:

1. Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rainfall.
2. Contractor shall 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.
3. All pumps shall be maintained at all times in proper working order.
4. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
5. Remove snow and ice as required to minimize accumulations.

3.7 TEMPORARY FIELD OFFICE FOR CONTRACTOR:

- A. 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 the 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. Arrangements shall be made by the Contractor whereby its representative may be readily accessible by telephone.
- E. All temporary structures shall be of substantial construction and neat appearance, and shall be painted a uniform gray unless otherwise directed by the Commissioner.
- F. **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.

- 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.

3.8 DDC FIELD OFFICE:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 A

A. OFFICE SPACE IN EXISTING BUILDING:

1. The Resident Engineer will arrange for office space for sole use in the building where work is in progress. The Contractor shall provide and install a lockset for the door to secure the equipment in the room. The Contractor shall provide two (2) keys to the Resident Engineer. After completion of the project the Contractor shall replace the original lockset on the door and ensure its proper operation.
2. In addition to equipment specified in Sub-Section 3.8 D, the Contractor shall provide, for exclusive use of the DDC Field Office, the following:
 - a. 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 metal (2) lockers, 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.
 - b. 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.
 - c. One (1) folding conference table, 96" x 30" and ten (10) folding chairs.
 - d. Two (2) metal wastebaskets.
 - e. One (1) fire extinguisher, one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.
 - f. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the project as required.
3. The Contractor shall provide one (1) telephone, where directed and shall pay all costs for telephone service for calls within the New York City limits for the duration of the project.
4. All furniture and equipment, except computer equipment specified in Sub-Section 3.8 D.3, shall remain the property of the Contractor.
5. Computer Workstation quantities shall be provided as specified in Sub-Section 3.8 B 3-a for DDC Managed Projects, or Sub-Section 3.8 B 3-b for CM Managed Projects.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 B

B. DDC FIELD OFFICE TRAILER:

1. GENERAL: The Contractor shall, for the time frame specified herein, provide and maintain at its own cost and expense a DDC Construction Field Office and all related items as specified herein [hereinafter collectively referred to as the "DDC Field Office"] for the exclusive use of the Resident Engineer. The DDC Field Office shall be located at the Project site and shall be solely dedicated to the Project. Provision of the DDC Field Office shall commence within THIRTY (30) days from Notice to proceed and shall continue through forty-five (45) days after Substantial Completion of the required construction at the Project site. The Contractor shall remove the DDC Field Office forty-five (45) days after Substantial Completion of the required construction, or as otherwise directed in writing by the Commissioner.
2. TRAILER: The Contractor shall provide at its own cost and expense a mobile office trailer for use as the DDC Field Office. The Contractor shall install and connect all utility services to the



trailer within thirty (30) days from Notice to Proceed. The trailer shall have equipment in compliance with the minimum requirements hereinafter specified. Any permits and fees required for the installation and use of said trailer shall be borne by the Contractor. The trailer including furniture and equipment therein, except computer equipment specified in Sub-Section 3.8D.3 herein, shall remain the property of the Contractor.

3. Trailer shall be an office type trailer of the size specified herein, with exterior stairs at entrance. Trailer construction shall be minimum 2 x 4 wall construction fully insulated with paneled interior walls, pre-finished gypsum board ceilings and vinyl tile floors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8.B.3a or
SUB-SECTION 3.8.B.3b

- a. DDC Managed Project Trailer: DDC Field Office Trailer Size, Layout and Computer Workstation:

- 1) Overall length: 32 Feet
Overall width: 10 Feet
- 2) Interior Layout:
Provide one (1) general office/conference room area and one (1) private office at one end of the trailer. Provide equipment and amenities as specified in Sub-Section 3.8.B herein.
- 3) Computer Workstation: Provide one (1) complete computer workstation, as specified in Sub-Section 3.8.D herein, in the private office area as directed by the Resident Engineer.

- b. CM Managed Project Trailer: DDC Field Office Trailer Size, Layout and Computer Workstation:

- 1) Overall length: 50 Feet
Overall width: 10 Feet
- 2) Interior Layout:
Provide one (1) large general office/conference room in the center of the trailer and two (2) private offices, one (1) each at either end of the trailer. Provide equipment and amenities as specified in Sub-Section 3.8.B herein.
- 3) Computer Workstation:
Provide three (3) complete computer workstations as specified in Sub-Section 3.8.D herein. Provide one (1) each complete computer workstation in each private office and one (1) complete computer workstation at the secretarial position as directed by the Resident Engineer.

4. The exterior of the trailer shall be lettered with black block lettering of the following heights with white borders:

| | |
|---------------------------------------|--------|
| CITY OF NEW YORK | 2-1/2" |
| DEPARTMENT OF DESIGN AND CONSTRUCTION | 3-3/4" |
| DIVISION OF PUBLIC BUILDINGS | 3-1/2" |
| DDC FEILD OFFICE | 2-1/2" |

NOTE: In lieu of painting letters on trailer the Contractor may substitute a sign constructed of a good quality weatherproof material with the same type and size of lettering above.

5. All windows and doors shall have aluminum insect screens. Provide wire mesh protective guards at all windows.
6. The interior shall be divided by partitions into general and private office areas as specified herein. Provide a washroom located adjacent to the private office and a built-in wardrobe closet opposite the washroom. Provide a built-in desk in the private office(s) with fixed overhead shelf and clearance below for two (2) file cabinets.



7. Provide a built-in drafting or reference table, located in the general office/conference room, at least 60 inches long by 36 inches wide with cabinet below and wall type plan rack at least 42 inches wide.
8. The washroom shall be equipped with a flush toilet, wash basin with two (2) faucets, medicine cabinet, complete with supplies 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.
9. HVAC: The trailer shall be equipped with central heating and cooling adequate to maintain a temperature of 72 degrees during the heating season and 75 degrees during the cooling season when the outside temperature is 5 degrees F. winter and 89 degrees F. summer.
10. Lighting shall be provided via ceiling mounted fluorescent lighting fixtures to a minimum level of 50 foot candles in the open and private office(s) along with sufficient lighting in the washroom. Broken and burned out lamps shall be replaced by the Contractor. A minimum of four (4) duplex convenience outlets shall be provided in the open office and two (2) each in the private office(s). These outlets shall be in addition to special outlet requirements for computer stations, copiers, HVAC unit, etc.
11. Electrical service switch and panel shall be adequately sized for the entire trailer load. Provide dedicated circuits for HVAC units, hot water heater, copiers and other equipment as required. All wiring and installation shall conform to the New York City Electrical Code.
12. The following movable equipment shall be furnished:
 - a. 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) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks and two (2) full ball bearing two (2) drawer vertical legal filing cabinets in each private office located below built-in desk.
 - b. One (1) folding conference table, 96" x 30" and ten (10) folding chairs.
 - c. Three (3) metal wastebaskets.
 - d. One (1) fire extinguisher one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.
 - e. 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.
13. TRAILER TEMPORARY SERVICE: Plumbing and electrical work required for the trailer will be furnished and maintained as below.
 - a. PLUMBING WORK: The Contractor shall provide temporary water and drainage service connections to the DDC Field Office trailer for a complete installation. Provide all necessary soil, waste, vent and drainage piping.

Contractor to frost-proof all water pipes to prevent freezing.

 - 1) REPAIRS, MAINTENANCE: The Contractor shall provide repairs for the duration of the project until the trailer is removed from the site.
 - 2) DISPOSITION OF PLUMBING WORK: At the expiration of the time limit set forth in Sub-Section 3.8 B 1 herein, the temporary water and drainage connections and piping to the DDC Field Office trailer shall be removed by the Contractor 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.
 - b. ELECTRICAL WORK:
 - 1) The Contractor shall furnish, install and maintain a temporary electric feeder to the DDC Field Office trailer immediately after it is placed at the job site.
 - 2) The temporary electrical feeder and service switch/fuse shall be adequately sized based on the trailer load and installed per the New York City Electrical Code and complying with utility requirements.



- 3) Make all arrangements and pay all costs to provide electric service.
- 4) The Contractor shall 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 the duration of the project and for a period of forty-five (45) days after the date of Substantial Completion.
- 5) 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.
- 6) All repair work due to these removals shall be the responsibility of the Contractor.

c. MAINTENANCE

- 1) The Contractor shall provide and pay all costs for regular weekly janitor service and furnish toilet paper, sanitary seat covers, cloth towels and soap and maintain the DDC Field Office in first-class condition, including all repairs, until the trailer is removed from the site.
- 2) Supplies: The Contractor shall be responsible for providing (a) all office supplies, including without limitation, pens, pencils, stationery, filtered drinking water and sanitary supplies, and (b) all supplies in connection with required computers and printers, including without limitation, an adequate supply of blank CD's/DVD's, storage boxes for blank CDs/DVDs, and paper and toner cartridges for the printer.
- 3) Risk of Loss: The entire risk of loss with respect to the DDC Field Office and equipment shall remain solely and completely with the Contractor. The Contractor shall be responsible for the cost of any insurance coverage determined by the Contractor to be necessary for the Field Office.
- 4) At forty-five (45) days after the date of Substantial Completion, or sooner as directed by the Commissioner, the Contractors shall have all services disconnected and capped to the satisfaction of the Commissioner. All repair work due to these removals shall be the responsibility of the Contractor.

d. TELEPHONE SERVICE: The Contractor shall provide and pay all costs for the following telephone services for the DDC Field Office trailer:

- 1) Separate telephone lines for one (1) desk phone in each private office.
- 2) One (1) wall phone (with six (6) foot extension cord) at plan table.
- 3) Separate telephone lines for the fax machine and internet access in each private office. Telephone service shall include voice mail.
- 4) A remote bell located on outside of trailer
- 5) The telephone service shall continue until the trailer is removed from the site.

e. PERMITS: The Contractor shall make the necessary arrangements and obtain all permits and pay all fees required for this work.

- C. RENTED SPACE: The Contractor 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 the DDC Field Office must be approved by the Commissioner before the area is rented. All insurance, maintenance and equipment, including computer workstations specified in Sub-Section 3.8 D in quantities required as specified in Sub-Section 3.8 B 3 for the DDC Field Office trailer, shall also apply to rented spaces.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 D

D. ADDITIONAL EQUIPMENT FOR THE DDC FIELD OFFICE:

1. The Contractor shall provide a high volume copy machine (50 copies per minute) for paper sizes 8½ x 11, 8½ x 14 & 11 x 17. Copier shall remain at job site until the DDC Field office trailer is removed from the site.



2. The Contractor shall furnish a fax machine and a telephone answering machine at commencement of the project for the exclusive use of the DDC Field Office. 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.
3. **COMPUTER WORKSTATION:** The Contractor shall provide one complete computer workstation, in quantities specified in Sub-Section 3.8.B.4, as specified herein:
 - a. **Hardware/Software Specification:**
 - 1) **Computer Equipment** - Computers shall be provided for all contracts that have a Total Consecutive Calendar Days for construction duration as set forth in Schedule "A" of 180 CCD's or greater. Contracts of lesser duration shall not require computers.
 - 2) Computers furnished by the Contractor for use by City Personnel, for the duration of the contract, shall be in accordance with Specific Requirements, contained herein, shall remain the property of the City of New York at the completion of the project and shall meet the following minimum requirements:
 - 3) **Personal Computer(s) – Each Workstation Configuration.**
 - a) **Make and Model:** Dell; HP; Gateway; Acer; or, an approved equivalent. (Note: an approved equivalent requires written approval of the Assistant Commissioner of ITS.)
 - b) **Processor:** i5-2400 (6MB Cache; 3.1GHz) or faster computer - Single Processor.
 - c) **System RAM:** Minimum of 4GB (Gigabytes) Dual Channel DDR3 SDRAM at 1333MHz – 2 DIMMSs
 - d) **Hard Disk Drive(s):** 500 GB (Gigabytes) Serial ATA (7200RPM) w/DataBurst Cache, 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, and three (3) USB Ports.
 - h) **Video Display Card:** HD Graphics (VGA, HDMI) with a minimum of 64 MB of RAM.
 - i) **Monitor:** 22" W, 23.0 Inch VIS, Widescreen, VGA/DVI LCD Monitor.
 - j) **Available Exp. Slots:** System as configured above shall have at least two (2) full size PCI Slots available.
 - k) **Network Interface:** Integrated 10/100/1000 Ethernet card.
 - l) **Other Peripherals:** Optical scroll Mouse, 101 Key Keyboard, Mouse Pad and all necessary cables.
 - m) **Software Requirement:** Microsoft Windows 7 Professional SP1, 32 bit; Microsoft Office Professional 2010 or 2013; Microsoft Project 2010; Adobe Acrobat reader; Anti-Virus software package with 2 year updates subscription; and, either Auto Cad LT or Microsoft



Visio Standard Edition, as directed by the Resident Engineer.

- 4) DDC Field Office Specs: DDC Field Offices requiring computers shall be provided with the following:
 - a) One (1) broad-band internet service account. Wideband Internet connectivity at a minimum throughput of 15 Mbps download and 5 Mbps upload is required at each field office location with 1-5 staffers. For larger field offices see table below for minimum required upload speeds. Telephone service should be bundled together with Internet connectivity. Because of throughput requirements Verizon FIOS is the preferred connectivity provider where available.

| Office Personnel # | Upload Speeds
(Minimum) |
|--------------------|----------------------------|
| 1 – 5 | 5 Mbps |
| 6 – 10 | 10 Mbps |
| 11 – 15 | 15 Mbps |
| 16 – 20 ... | 20 Mbps |

This account will be active for the life of the project. The e-mail name for the account shall be the DDC Field Office/project Id (e.g. FLD K HWK666 McGuinness@earthlink.com).

- b) One (1) 600 DPI HP Laser Jet Printer (twelve (12) pages per minute or faster) with one (1) Extra Paper (Legal Size)
 - c) All necessary cabling for equipment specified herein.
 - d) Storage Boxes for Blank CD's
 - e) Printer Table
 - f) UPS/Surge Suppressor combo
- 5) All computers required for use in the Engineer's Field Office shall be delivered, installed, and setup in the Field Office by the Contractor.
- 6) 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.
- 7) An adequate supply of blank CDs/DVDs, 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 Resident Engineer.
- 8) 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.
- 9) 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 the Assistant Commissioner of Information Technology Services at 718-391-1761.
- 10) Ownership: The equipment specified above shall, unless otherwise directed by the Commissioner, be the sole property of the City of New York upon delivery to the DDC Field Office. The Contractor shall prepare and maintain an accurate inventory of all equipment which it purchases for the DDC Field Office. Such inventory shall be provided to the City of New York. Upon completion of the



required services, as directed by the Commissioner, the Contractor shall turn such equipment over to the City of New York.

E. 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 DDC Field Office.
2. Upon completion of the project, the helmets shall become the property of the Contractor.

3.9 MATERIAL SHEDS:

- A. 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.
- B. Store combustible materials apart from the facility.

3.10 TEMPORARY ENCLOSURES:

- A. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.
- B. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

3.11 TEMPORARY PARTITIONS:

- A. Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied tenant areas from fumes and noise.
 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
 2. Construct dustproof partitions with 2 layers of 3-mil (0.07-mm) polyethylene sheet on each side. Cover floor with 2 layers of 3-mil (0.07-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.
 - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
 3. Insulate partitions to provide noise protection to occupied areas.
 4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
 5. Protect air-handling equipment.
 6. Weather strip openings.
 7. Provide walk-off mats at each entrance through temporary partition.

3.12 TEMPORARY FIRE PROTECTION:

- A. Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
- B. Prohibit smoking in all areas.
- C. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.



- D. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
- E. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 5.13

3.13 WORK FENCE ENCLOSURE:

- A. The Contractor shall furnish, erect and maintain a wood construction or chain-link fence to the extent shown on the drawings or required by the work enclosing the entire project on all sides. All materials used shall be new. Any permit required for the installation and use of said fence and costs shall be borne by the Contractor.
- B. WOOD FENCE shall be 7'-0" high with framing construction of yellow pine, using 4" x 4" approved preservative-treated posts on not more than 6'-0" centers, with three (3) rails of at least 2" x 4" size to which shall be secured minimum 1/2 inch thick exterior grade plywood. 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.
 - 1. 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 provided with tension or sag rods for the swinging sections.
 - 2. PAINTING - The fence and gates shall be entirely painted on the street and public sides with one (1) coat of exterior primer and one (1) top coat of exterior grade acrylic-latex emulsion paint. Black stenciled signs reading "POST NO BILLS" shall be painted on fence with three (3) inch high letters on 25 foot spacing for the entire length of fence on street traffic sides. Signs shall be stenciled five (5) feet above the sidewalk.
- C. CHAIN-LINK FENCING shall be minimum 2-inch thick, galvanized steel, chain-link fabric fencing; 8 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Fence shall be accurately aligned and plumb, adequately braced and complete with gates, locks and hardware as required. Under no condition shall fencing be attached or anchored to existing construction or trees.
- D.
 - 1. It shall be the obligation of the Contractor to remove all posters, advertising signs, and markings, etc., immediately.
 - 2. Should the fencing be required to be relocated during the course of the Contract, it shall be done by the Contractor at no additional cost to the City.
 - 3. Where sidewalks are used for "drive over" purposes for Contractor vehicles, a suitable wood mat or pad shall be provided for protection of sidewalks and curbs.
 - 4. Where required, make provision for fire hydrants, lampposts, etc.
 - 5. REMOVAL - When directed by the Resident Engineer, the fence shall be removed.

3.14 RODENT AND INSECT CONTROL:

- A. DESCRIPTION: The 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:

- 1 Wet areas within the project area, including all temporary structures.
- 2 All exterior and interior temporary toilet structures within the project area.
- 3 All Field Offices and shanties within the project area of all subcontractors and DDC.
- 4 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.
- 5 Any other portion of the premises requiring such special attention.

B. MATERIALS:

- 1 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.

C. PERSONNEL:

- 1 All pest control personnel must be supervised by an exterminator licensed in categories 7A and 8.

D. METHODS:

1. Application and dosage of all materials shall be done in strict compliance with the manufacturer's recommendations.
2. Any unsanitary conditions, such as uncollected garbage or debris, resulting from all Contractor's activities, which will provide food and shelter to the resident rodent population shall be corrected by the Contractor immediately after notification of such condition by the Resident Engineer.

E. RODENT CONTROL WORK:

- 1 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 stream banks. Live traps must be used in these seventy-five (75) foot buffer zone areas and within wetland and woodland areas.
- 2 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.
- 3 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.
- 4 The Contractor shall be responsible for collecting and disposing of all trapped and poisoned rodents found in live traps and tamper proof bait stations. The Contractor shall also be responsible for posting and maintaining signs announcing the baiting of each particular location.
The Contractor shall be responsible for the immediate collection and disposal of any visible rodent remains found on streets or sidewalks within the project area.
- 5 It is anticipated that public complaints will be addressed to the Commissioner. The 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.
- 6 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.



F. EDUCATION & NOTICES:

- 1 The 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 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.
- 2 Prior to application of any chemicals, the 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.

G. RECORDS

1. The 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.
2. The Contractor shall maintain records of all locations baited along with the type and quantity of rodenticide and insecticide bait used.

3.15 PLANT PEST CONTROL REQUIREMENTS and TREE PROTECTION REQUIREMENTS:

A. Plant Pest Control Requirements: 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.

1. 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.
2. 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.
3. 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.
4. 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.

- B. 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.
1. 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 in paragraph A above; (3) evaluation of the general health and condition of any infected plant material.
 2. 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.
 3. 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.
 - a. 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).
 - b. 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.
 - c. The Certified Arborist determines that the critical root zone (GRZ) 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.
 4. 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.

- C. 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.

3.16 PROJECT IDENTIFICATION SIGNAGE:

- A. The Contractor shall provide, install and maintain Project identification and other signs where indicated to inform public and individuals seeking entrance to the Project.
- B. 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

- C. 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).
- D. Provide temporary, directional signs for construction personnel and visitors.
- E. Maintain and touch up signs so that they are legible at all times.

3.17 PROJECT CONSTRUCTION SIGN AND RENDERING:

- 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 place and in a position 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 the sign in first class condition and in proper position. Prior to fabrication, the Contractor shall submit an 8-1/2" x 11" color match print proof from the sign manufacturer of the 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 pre-finished 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. A digital file of the project sign will be provided to the Contractor by the Commissioner's representative for printing. 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. All signs may include a second panel for a project rendering as described in Sub-Section 3.17.B herein.
 - b. The digital file shall be reproduced at the Sign Panel size of 4' x 8' on 3M High Performance Vinyl or approved equal. The 3M High Performance Vinyl or equivalent shall be guaranteed for nine (9) years. Guarantee must cover fading, peeling, chipping or cracking. The sign manufacturer is required to maintain all specified Pantone Matching System (PMS) type and other composition elements represented in the digital file of the project sign.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.17.B

B. PROJECT RENDERING:

1. Responsibility: In addition to the Project Sign, the Contractor shall furnish and install one (1) sign showing a rendering of the project. A digital file of the project rendering will be provided to the Contractor by the Commissioner's representative. From an approved image file provided by DDC, the Project Rendering is to be sized, printed, and mounted in an identical manner as described in Sub-Section 3.17.A above for the Project Sign. 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.18

3.18 SECURITY GUARDS/FIRE GUARDS ON SITE:

A. SECURITY GUARDS (WATCHMEN):

1. The Contractor shall provide competent Security Guard Service on the site, beginning on the date on which the Contractor commences actual construction work, or on such earlier date on which there is activity at the site related to the work, including without limitation, delivery of



materials or construction set-up. The Contractor shall continue to provide such Security Guard Service until the date on which it completes all required work at the site, including all punch list work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. Throughout the specified time period, 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 trade subcontractors. 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.

2. Every Security Guard shall be required to hold a "Certificate of Fitness" issued by the Fire Department. Every Security Guard shall, during his/her tour of duty, perform the duties of Fire Guard in addition to his/her security obligations.
 3. Should the Commissioner find that any Security Guard is unsatisfactory; such guard shall be replaced by the Contractor upon the written demand of the Commissioner.
 4. Each Security Guard furnished by the Contractor shall be instructed by the Contractor to include in his/her duties the entire construction site including the Field Office, temporary structures, and equipment, materials, etc.
 5. Should the Contractor or any other subcontractor consider the security requirements outlined above inadequate, the Contractor 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.
 6. Nothing contained in this Sub-Section shall diminish in any way the responsibility of the Contractor and each subcontractor 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 shall employ Security Guards/Fire Guards throughout the specified time period, 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.
- C. RESPONSIBILITY - The Contractor and its subcontractors will be responsible for safeguarding and protecting their own work, materials, tools and equipment.

3.19 SAFETY:

- A. The Contractor, in compliance with requirements of Section 01 35 26, SAFETY REQUIREMENTS PROCEDURES, shall provide and maintain all necessary temporary closures, guard rails, and barricades to adequately protect all workers and the public from possible injury. Any removal of these items, during the progress of the work, shall be replaced by the Contractor at no additional cost to the City.

END OF SECTION 01 50 00



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITION
SINGLE CONTRACT PROJECTS

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TEMPORARY FACILITIES, SERVICES AND CONTROLS
01 50 00 -28



**SECTION 01 54 11
TEMPORARY ELEVATORS AND HOISTS**

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This section includes the following:
1. Temporary Use, Operation and Maintenance of Elevators during Construction
 - a. For New buildings up to 15 Stories
 - b. For New buildings over 15 Stories
 - c. For Existing Buildings
 2. Temporary Construction Hoists and Hoist ways (For Material and Personnel)

1.3 RELATED SECTIONS: include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 42 00 REFERENCES
- C. Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS
- D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING
- E. Section 01 77 00 CLOSE OUT PROCEDURES

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.1

3.1 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDINGS UP TO AND INCLUDING 15 STORIES:

- A. **INSTALLATION:** The Contractor shall install, complete, operate, and maintain in good working order, as indicated herein, one (1) selected main elevator for the transport of employees of the Contractor and/or its subcontractors, and representatives of the DDC and other Governmental Agencies having jurisdiction of work at the project. The Contractor shall furnish, install, and maintain such elevator in good working order, including 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, operation 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 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.



- C. **COSTS:** The Contractor shall be responsible for all costs in connection with the temporary elevator, including without limitation: (1) installing and operating 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) performing all work in pits, shaft ways and machine rooms necessary for the operation of the temporary elevator, (4) replacing the temporary elevator or any equipment or parts utilized in connection therewith, if required, due to damage, destruction or excessive wear or corrosion, except for the replacement of hoisting ropes as set forth below, (5) performing all required electrical work in connection with the temporary elevator, (6) providing all electric power required to operate the temporary elevator, (7) providing all necessary conduit and wiring connections for the proper operation and signaling of the temporary elevator, and (8) providing all labor for the operation and maintenance of the temporary elevator, including on an overtime basis if necessary. The total Contract Price shall include all costs in connection with the temporary elevator, including without limitation, the costs specified herein.
- D. **COMMENCEMENT OF SERVICE:** The Contractor 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 shaft way 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 shaft ways.
 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, 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 shaft way and for the car control and signal traveling cables. The Contractor shall make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.
- F. **REMOVAL:** When elevators for permanent use have been installed and are in condition for service, and when directed by the Commissioner, the Contractor shall remove the temporary enclosures and all temporary elevator equipment and promptly proceed with the installation of the permanent equipment as required under the Contract.
- G. **INSPECTION:** Before temporary elevator equipment is removed, a joint inspection of the equipment shall be made by the Contractor 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 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 therefore will be made in accordance with Article 26 of the Contract.



- H. **REPLACEMENT:** The Contractor shall furnish and install new equipment or parts for any equipment or parts of the temporary elevator installation that have been damaged, destroyed, or that indicate excessive wear or corrosion, excepting the replacement of hoisting ropes. All shaft ways, 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 except for the replacement of hoisting ropes.
- I. **LIMITATIONS ON USE:** The temporary elevator shall not be used during its operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and representatives of DDC and other Governmental Agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its subcontractors 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. In the event of any damage to the temporary elevator, the Contractor shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.
- J. **LIQUIDATED DAMAGES:** The Contractor 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUBSECTION 3.2

3.2 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDING OVER 15 STORIES:

- A. **INSTALLATION:** The Contractor shall install, complete, operate, and maintain in good working order, as indicated herein, two (2) selected main elevators for the transport of employees of the Contractor and/or its subcontractors, and representatives of the DDC and other Governmental Agencies having jurisdiction of work at the project. The Contractor shall furnish, install, and maintain such elevators in good working order, including 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, operation and maintenance of the temporary elevators 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 shall not be operated simultaneously.
- B. **RESPONSIBILITY:** The Contractor shall be responsible for any injury to persons or damage to property arising out of the temporary elevators and all equipment and/or parts utilized in connection therewith.
- C. **COSTS:** The Contractor shall be responsible for all costs in connection with the temporary elevators, including without limitation: (1) installing and operating the temporary elevators, (2) maintaining the temporary elevators in clean, proper operating condition, including the cost of lubricants and/or parts for such maintenance, (3) performing all work in pits, shaft ways and machine rooms necessary for the operation of the temporary elevators, (4) replacing the temporary elevators or any equipment or parts utilized in connection therewith, if required due to damage, destruction or excessive wear or corrosion, except for the replacement of hoisting ropes as set forth below, (5) performing all required electrical work in connection with the temporary elevators, (6) providing all electric power required to operate the temporary elevators, (7) providing all necessary conduit and wiring connections for the proper operation and signaling of the temporary elevators, and (8) providing all labor for the operation and maintenance of the temporary elevators, including on an overtime basis if necessary. The total Contract Price shall



include all costs in connection with the temporary elevators, including without limitation, the costs specified herein.

- D. **LOW RISE ELEVATOR:** The Contractor 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 shaft ways.
 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 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 shall make all these required connections as soon as the Equipment is declared ready for such connections by the Resident Engineer.
- F. **HIGH RISE ELEVATOR:** The Contractor 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 shaft way 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 shaft ways.
 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. **ELECTRICAL INSTALLATION:** The Contractor, 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 shaft way. The Contractor shall make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.
- H. When the high rise elevator is completed and ready for temporary operation, the low rise temporary elevator shall be shut down.
- I. **REMOVAL:** 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 shall remove the temporary enclosures and all temporary elevator equipment, and promptly proceed with the installation of the permanent equipment as required under the Contract.
- J. **INSPECTION:** Before temporary elevator equipment is removed, a joint inspection of the equipment shall be made by the Contractor 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 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 therefore will be made in accordance with Article 26 of the Contract.
- K. **REPLACEMENT:** The Contractor shall furnish and install new equipment or parts for any equipment or parts of the temporary elevator installations that have been damaged, destroyed, or that indicate excessive wear or corrosion, excepting the replacement of hoisting ropes. All shaft ways, 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 except for the replacement of hoisting ropes.
- L. **LIMITATIONS ON USE:** The temporary elevators shall not be used during their operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and representatives of DDC and other Governmental Agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its subcontractors 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. In the event of any damage to the temporary elevator, the Contractor shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.
- M. **LIQUIDATED DAMAGES:** The Contractor 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR EXISTING BUILDINGS:

- A. The Contractor may use, at the Commissioner's discretion, one (1) selected elevator in the building for temporary operation by the Contractor for the transportation of employees of the Contractor and/or its subcontractors, and representatives of DDC and other Governmental Agencies having jurisdiction over the work at the Project. The operation 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 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.
- C. **REPLACEMENT:** The Contractor shall furnish and install new equipment or parts for any equipment or parts of the elevator for temporary operation that have been damaged, destroyed, or that indicate excessive wear or corrosion, excepting the replacement of hoisting ropes. All shaft ways, 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 except for the replacement of hoisting ropes. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes shall be installed and payment therefore will be made in accordance with Article 26 of the Contract.
- D. **LIMITATIONS ON USE:** The temporary elevator shall not be used during its operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and representatives of DDC and other Governmental Agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation. In the event of any damage to the temporary elevator, the Contractor shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.
- E. **LIQUIDATED DAMAGES:** The Contractor 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.

3.4 TEMPORARY HOISTS AND HOISTWAYS (FOR MATERIAL AND PERSONNEL):

- A. **RESPONSIBILITY:** The Contractor shall provide adequate numbers of material hoists for the most expeditious performance of all parts of the work including the work of all its subcontractors.
- 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 subcontractors. 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 hoist ways, providing such use complies with the requirements of the Building Code of the City of New York and has been approved by the Commissioner, and providing further it entails no interference with the progress of the work.
- D. **PROTECTION FOR INTERIOR HOISTS:** All interior material hoist ways 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.

END OF SECTION 01 54 11



SECTION 01 54 23
TEMPORARY SCAFFOLDING AND PLATFORMS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. Section 01 35 26: Safety Requirements Procedures.
- C. The Contractor shall comply with the requirements of *"The City of New York Department of Design and Construction Safety Requirements"*. This document is included in the Information for Bidders.

1.2 SUMMARY:

- A. This Section includes administrative and general procedural requirements for Temporary Scaffolding and Platforms, including:
 - 1. Conformance
 - 2. Responsibility
 - 3. Jobsite Documentation and Submittals
 - 4. Inspections
- B. This Section governs ALL scaffold used on DDC project sites including, but not limited to, Suspended Scaffold, Supported Scaffold and Sidewalk Sheds.

1.3 CONFORMANCE:

- A. Unless otherwise indicated, the Contractor 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 items and personnel set forth in this section.

1.4 RESPONSIBILITY:

- A. Jobsite Safety Coordinator: The Contractor shall designate and employ a Jobsite Safety Coordinator, who shall be a competent person, who shall have a daily presence on the project 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 Safety Coordinator is absent. The Jobsite Safety Coordinator shall:
 - 1. Verify completeness of documentation and submittals (as described below).
 - 2. Verify that inspections are performed, including pull tests (see below), reports are filed and reported deficiencies are corrected.
 - 3. Monitor trades using scaffold.
 - 4. Limit access to scaffold areas that are tagged for non-use.
 - 5. Inform trades of scaffold load limitations.
 - 6. Monitor loading of decks.
 - 7. Verify that any ties that are temporarily removed are properly restored in the same shift.
 - 8. Verify that outriggers and planks that are moved are properly set up and secured.
 - 9. Verify that all scaffold decks in use have proper access/egress.
 - 10. Verify that all open sides of decks in excess of 14 inches have proper guardrails and toe-boards.



11. 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.
 12. Keep a log of significant actions and events connected with the scaffolding.
- B. The Contractor shall be responsible for erecting, maintaining and dismantling the scaffolding and/or sidewalk shed in conformance with requirements of the New York City Building Code, OSHA and the Contract documents, including the specifications. The Contractor shall also be guided by generally accepted standards of scaffold industry practice as promulgated by the Scaffold Industry Association.
- C. The Contractor shall require the subcontractor responsible for erecting the scaffolding to engage a Scaffold Engineer, licensed as a professional engineer by the State of New York. The Scaffold Engineer shall be responsible to ensure the following: (1) that the installation design is in compliance with requirements of the New York City Building Code and OSHA, (2) that the design comports with the capabilities of the components and the characteristics of the site, (3) that scaffold loads on the host building, including netting, have been properly considered, and (4) that the design documents provide accurate information for erectors and users.
- D. 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 Safety Coordinator and to inform the Jobsite Safety Coordinator of known hazards, non-conformances or violations.

1.5 JOBSITE DOCUMENTATION AND SUBMITTALS:

The Contractor shall prepare, obtain and submit the following to the Resident Engineer:

- A. 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;
- B. Site logistics plan / site safety plan;
- C. Installation drawing(s), design and product data to be provided for **all** scaffold(s) and shed(s) must include, at a minimum:
 1. Plan(s);
 2. Elevation(s);
 3. Duty load designation; "standard" (150 psf live load) or "heavy duty" (300 psf live load).
 4. Details including base support, anchors and ties;
 5. Notes and specifications including load limits, number of planked levels, tie spacing, netting, and sequence of installation and removal.
 6. Anchorage into sound material.
 7. Load limits based on pull tests;
 8. Specifications for pull test(s), method, proof load and the number of trials;
 9. Elevations, levels or heights, where anchorage is made into masonry;
 10. Specifications for frames, planks, screw jacks, anchors, and any other ancillary hardware;
 11. Samples for anchors, ties and netting;
 12. Sequence of operations for erection and demolition;
 13. Location plan, heights, widths, "jumps" over doorways and driveways;
 14. Specify size, maximum span and maximum spacing of headers and stringers;
 15. Specify legs, girts, braces, nailing and connections;
 16. All sidewalk sheds shall be designed, engineered, signed and sealed by a Professional Engineer licensed in the State of New York;
 - a. Generic (not job specific) engineering drawings are satisfactory for standard sheds and arrangements.



- b. Special engineering is required for custom sheds, site-specific problems or non-standard arrangements.

1.6 INSPECTIONS:

- A. Signed inspection reports shall be issued for each inspection and pull-test below, and shall be logged and maintained on site by the Jobsite Safety Coordinator for the duration of the project.
- B. 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.
- C. 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.
- D. 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.
- E. 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.
- F. 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.
- G. Scaffolds and Sidewalk Sheds shall be inspected daily by the Jobsite Safety Coordinator or alternate prior to use by scaffold users. The inspection results must be recorded in the maintenance log, and be available on-site at all times.
- H. At the completion of the project, submit all inspection documents as Miscellaneous Record Documents in accordance with Section 01 78 39, CONTRACT RECORD DOCUMENTS.

1.7 LADDERS AND STAIRS:

- A. The Contractor 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.

1.8 ACCESS AND EXITS:

- A. 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.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 54 23



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITION
SINGLE CONTRACT PROJECTS
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No Text

TEMPORARY SCAFFOLDING AND PLATFORM
01 54 23 - 4



**SECTION 01 73 00
EXECUTION**

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section includes general procedural requirements governing execution of the Work including without limitation the following:
1. Delivery of Materials
 2. Contractor's Superintendent
 3. Surveys
 4. Borings
 5. Examination
 6. Environmental Assessment
 7. Preparation
 8. Deferred Construction
 9. Installation
 10. Permits
 11. Transportation
 12. Sleeves and Hangers
 13. Sleeve and Hanger Drawings
 14. Cutting and Patching
 15. Location of Partitions
 16. Furniture and Equipment
 17. Removal of Rubbish and Surplus Material
 18. Cleaning
 19. Security And Protection of Work Site
 20. Maintenance of Site and Adjoining Property
 21. Maintenance of Project Site
 22. Safety Precautions for Control Circuits
 23. Obstructions in Drainage Lines

1.3 RELATED SECTIONS: Include without limitation the following:

- | | | |
|----|------------------|--|
| A. | Section 01 10 00 | SUMMARY |
| B. | Section 01 31 00 | PROJECT MANAGEMENT AND COORDINATION |
| C. | Section 01 33 00 | SUBMITTAL PROCEDURES |
| D. | Section 01 74 19 | CONSTRUCTION WASTE MANAGEMENT & DISPOSAL |
| E. | Section 01 77 00 | CLOSEOUT PROCEDURES |
| F. | Section 01 78 39 | CONTRACT RECORD DOCUMENTS |



1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 QUALITY ASSURANCE:

- A. Land Surveyor Qualifications: A professional land surveyor who is licensed in the State of New York and who is experienced in providing land-surveying services of the kind indicated.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 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. Deliveries: The Contractor shall coordinate deliveries in order to avoid delaying or impeding the progress of the work.
- E. Handling: The Contractor shall provide equipment and personnel to handle products by methods to prevent soiling or damage.
 - 1. Promptly inspect shipments to assure products comply with requirements, quantities are correct, and products are undamaged.
 - 2. Promptly return damaged shipments or incorrect orders to manufacturer.
 - 3. For materials or equipment to be reused or salvaged, use special care in removal, storage and reinstallation to insure proper function in completed work.
- F. Storage: Store products in accordance with provisions of Article 3.1, and periodically inspect to assure that stored products are undamaged and are maintained under required conditions.
- G. 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.
- H. 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.



- I. 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 trade subcontractor, the Contractor shall remove and restack such materials at no additional cost to the City.

3.2 CONTRACTOR'S CONSTRUCTION SUPERINTENDENT:

- A. Contractor's Construction 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 Construction Superintendent. The Contractor's Construction Superintendent shall be registered with the New York City Department of Buildings in compliance with the Construction Superintendent Rule of the City of New York and shall be competent and capable of maintaining proper supervision and care of the work and shall be acceptable to the Commissioner. The Construction Superintendent shall, 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 Construction Superintendent on the job shall not be changed or removed without the consent of the Commissioner.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 SURVEYS:

- 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: The 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 Markers: 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 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 shall establish the permanent lines of exterior walls. The 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 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 land Surveyor licensed in the State of New York 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 shall submit to DDC 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB SECTION 3.4

3.4 BORINGS:

- A. The work of this article shall be the responsibility of the Contractor unless otherwise indicated.
- B. **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:
1. **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.
 2. **Soils 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.
 3. **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.
 4. **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.
 5. **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.



3.5 EXAMINATION:

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground utilities and other construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with the subcontractor responsible for installation or application present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.6 ENVIRONMENTAL ASSESSMENTS:

- A. City Responsibilities: An Environmental Assessment and survey is performed by the NYC DDC and its findings are included in the Contract Documents. In accordance with the NYC Administrative Code Title 15 Chapter 1 an asbestos survey is required to be performed by an Asbestos Investigator certified by the NYC Department of Environmental Protection (DEP) to identify the presence of asbestos containing material (ACM) prior to any alteration, renovation or demolition activity. The findings of such survey are required for the submission of approvals and permits issued by the NYC Department of Buildings (DOB). When the findings indicate that asbestos containing material is present and will be disturbed during the alteration, renovation or demolition activity then abatement design specifications will be incorporated into the contract documents. The Contractor shall comply with all federal, state and local asbestos regulations affecting the work for this Contract.
- B. Contractor Responsibility: The Contractor shall comply with all federal, state and local environmental regulations, including without limitation USEPA and OSHA regulations which require the Contractor to assess if lead based paint will be disturbed during the work in order to protect his/her workers and the building occupants from migration of lead dust into the air. The Contractor shall comply with all federal, state and local environmental waste disposal regulation which may be required during the work. The Contractor is required to hire licensed abatement and disposal companies for the requisite work.

3.7 PREPARATION:

- A. Field Measurements: The Contractor shall verify all dimensions and conditions on the job so that all work will properly join the existing work.
- B. The Contractor, before commencing work, shall examine all adjoining work on which its work is in any way dependent on good workmanship in accordance to the intent of the Specifications and the Contract



Drawings. The Contractor shall report to the Commissioner any condition that will prevent it from performing work that conforms to the required standard.

- C. Existing Utility Information: Furnish information to the Commissioner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.8 DEFERRED CONSTRUCTION:

- A. 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 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.
- B. The Contractor shall confer with the affected trade subcontractors and ascertain arrangements, time and facilities necessary to be made by the Contractor in order to execute the provisions specified herein.

3.9 INSTALLATION:

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work and work of trade subcontractors to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the Design Consultant.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.



- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.10 PERMITS:

- A. 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.

3.11 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.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.12

3.12 SLEEVES AND HANGERS:

- A. Coordinate with Progress Schedule: The Contractor shall promptly furnish and install conduits, outlets, piping sleeves, boxes, inserts and all other materials and equipment that is to be built into the work in conformity with the requirements of the project.
- B. Cooperation of Subcontractors: All subcontractors 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 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 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.
- D. Inserts: The Contractor 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.



REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 SLEEVE AND PENETRATION DRAWINGS:

- 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 Contractor shall submit to the DDC 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 to determine if such penetrations will materially weaken the project's structure. The sketch shall be stamped and returned if approved and/or comments will be transmitted. The Contractor shall continue to submit sketches as the pouring schedule and the concrete work progresses and, until approvals for the penetration sketches have been given. The Contractor shall not predicate its layout work on unapproved sketches.

3.14 CUTTING AND PATCHING:

- A. Responsibility: The Contractor shall do all cutting, patching and restoration required by its work, unless otherwise particularly specified in the Specifications.
- B. Restore Work: The Contractor shall restore any work damaged during the performance of the work.
- 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. Structural Elements: Do not cut and patch structural elements without the prior approval, in writing, of the Resident Engineer.
- E. Operational Elements: Do not cut and patch operating elements and related components.
- F. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Commissioner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- G. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.
- H. Removals: The 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 Sub-Section 3.17 herein and as further required in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.15

3.15 LOCATION OF PARTITIONS:

- A. Within three (3) weeks after the concrete slabs have been poured on each floor level, the Contractor shall immediately locate accurately all of the partitions, including the door openings, on the floor slabs in a manner approved by the Resident Engineer.



3.16 FURNITURE AND EQUIPMENT:

- A. Responsibility: The Contractor is responsible for moving all loose furniture and/or equipment in all areas where the location of 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.

3.17 REMOVAL OF RUBBISH AND SURPLUS MATERIALS:

- A. Of the waste that is generated during demolition, as many of the waste materials as economically feasible, and as stated here, shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized. Comply with requirements of Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
- B. 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.
- C. Location: The Contractor shall clean Project site and work area daily and sweep up and deposit, at a location designated on each floor, all of its rubbish, debris and waste materials, as it accumulates and when directed by the Resident Engineer. Wood crating shall be broken up, neatly bundled, tied and stacked ready for removal and be deposited at a location designated on each floor.
 - 1. Comply with requirements in NYC Fire Department for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 degrees F (27 degrees C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- D. Laborers: The Contractor 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 crating 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.
- E. Surplus Materials: The Contractor shall remove from the site all surplus materials when there is no further use for same.
- F. 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.
- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

3.18 CLEANING:

- A. The 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 up to date of Final Acceptance.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.



- E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration up to date of Final Acceptance.
- F. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration up to date of Final Acceptance.

3.19 SECURITY AND PROTECTION OF WORK SITE:

- A. Provide protection of installed work, including appropriate protective coverings and maintain conditions that ensure installed Work is without damage or deterioration up to date of Final Acceptance.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.
- C. Secure and protect work and work site against damage, loss, injury, theft and/or vandalism.
- D. Maintain daily sign-in sheets of workers and visitors and make the sheets available to the Commissioner

3.20 MAINTENANCE OF SITE AND ADJOINING PROPERTY:

- A. The Contractor shall take over and maintain the Project site, after order to start work.
- B. 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. until the date of Final Acceptance. The Contractor shall, at its own expense, except as otherwise specified, protect same and maintain them in at least as good a condition as that in which the Contractor finds them.
- C. 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.
- D. Provide and keep in good repair all bridging and decking necessary to maintain vehicular and pedestrian traffic.
- E. The Contractor shall also remove all snow and ice as it accumulates on the sidewalks within the Contract Limits Lines.

3.21 MAINTENANCE OF PROJECT SITE:

- A. The Contractor shall take over and maintain all project areas, after order to start work.
- B. Until the date of Final Acceptance, 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.
- C. 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.
- D. The Contractor shall keep the space for the Resident Engineer in a clean condition.

3.22 SAFETY PRECAUTIONS FOR CONTROL CIRCUITS:

- A. 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.

3.23 OBSTRUCTIONS IN DRAINAGE LINES:

- A. 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.

END OF SECTION 01 73 00

EXECUTION
01 73 00 - 10



SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This section includes administrative and procedural requirements for the management and disposal of construction waste and includes the following requirements:
1. Waste Management Goals
 2. Waste Management Plan
 3. Progress Reports
 4. Progress Meetings
 5. Management Plan Implementation
- B. This Section includes:
1. Definitions
 2. Waste Management Performance Requirements
 3. Reference Resources
 4. Submittals
 5. Quality Assurance
 6. Waste Plan Implementation
 7. Additional Demolition and Salvage Requirements
 8. Disposal

1.3 RELATED SECTIONS: Include without limitation the following:

- | | | |
|----|------------------|--|
| A. | Section 01 10 00 | SUMMARY |
| B. | Section 01 31 00 | PROJECT MANAGEMENT AND COORDINATION |
| C. | Section 01 32 00 | CONSTRUCTION PROGRESS DOCUMENTATION |
| D. | Section 01 73 00 | EXECUTION |
| E. | Section 01 77 00 | CLOSEOUT PROCEDURES |
| F. | Section 01 78 39 | CONSTRUCTION RECORD DOCUMENTS |
| G. | Section 01 81 13 | SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS |

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
- C. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk or the like.



- D. Construction and Demolition Waste: Solid wastes typically including building materials, trash debris and rubble resulting from remodeling, repair and demolition operations. Hazardous materials and land clearing waste are not included.
- E. Diversion from Landfill: To remove, or have removed, from the site for recycling, reuse or salvage, material that might otherwise be sent to a landfill.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product.
- G. Recycle (recycling): To sort, separate, process, treat or reconstitute solid waste and other discarded materials for the purpose of redirecting such materials into the manufacture of useful products. Recycling does not include burning, incinerating or thermally destroying waste.
- H. Return: To give back reusable items or unused products to vendors.
- I. Reuse: To reuse excess or discarded construction material in some manner on the Project site.
- J. Salvage: To remove a waste material from the Project site for resale or reuse.
- K. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable and reusable material.
- L. Waste Management Plan: A project-related plan for the collection, transportation and disposal of waste generated at the construction site. The purpose of the plan is to ultimately reduce the amount of material becoming landfill.

1.5 WASTE MANAGEMENT PERFORMANCE REQUIREMENTS:

- A. The City of New York has established that this project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, inaccurate planning, breakage, mishandling, contamination, or other factors shall be employed.
- B. Of the waste that is generated during demolition, as many of the waste materials as economically feasible, and as stated here, shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.5 C

- C. LEED CERTIFICATION: The City of New York will seek LEED (Leadership in Energy and Environmental Design) certification for this Project as indicated in the Addendum to the General Conditions from the U.S. Green Building Council. The documentation required here will be used for this purpose. LEED awards points for a variety of sustainable design measures on a project, one of which is the reuse and recycling of project waste.
- D. DIVERSION REQUIREMENTS. A minimum of 75% of total Project demolition waste (by weight) shall be diverted from landfill. The following waste categories are likely candidates to be included in the diversion plan as applicable for this project:
 - 1. Concrete
 - 2. Bricks
 - 3. Concrete masonry units (CMU)
 - 4. Asphalt
 - 5. Metals (e.g. banding, stud trim, ceiling grid, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, brass, bronze)

6. Clean dimensional wood
 7. Carpet and pad
 8. Drywall
 9. Ceiling tiles
 10. Cardboard, paper and packaging
 11. Reuse items indicated on the Drawings and/or elsewhere in the Specification
- E. All fluorescent lamps, HID lamps and mercury-containing thermostats removed from the site shall be recycled.
- F. Recycling on the job, subject to the Commissioner's approval, is encouraged on the site itself, such as the crushing and reuse of removed sound concrete and stone. Include these categories in the Waste Management Plan.

1.6 REFERENCES, RESOURCES:

- A. DDC encourages its contractors to seek information from websites and experts in salvage or recycling in order to minimize disposal costs. There are numerous opportunities to sell, salvage, or to donate materials and accrue tax benefits (which would accrue to the contractor); also there are outlets that will pick up, and in some cases buy recyclable materials. Examples of information resources are as follows:
1. DDC's Sustainable Design web site:
http://www.nyc.gov/html/ddc/html/design/sustainable_home.shtml This includes a manual on Construction and Demolition Waste Reduction and Recycling, a Sample Waste Management Plan and sample C&D Waste Management log. A standard Construction and Demolition Waste Management Log form is included at the end of this section.
 2. Web Resources
(Information only; no warranty or endorsement is implied.)
www.wastematch.org Site of New York Waste Match, a materials exchange database and service
www.bignyc.org Site of Build It Green NYC, a non profit outlet for salvaged and surplus building materials
www.usgbc.org Site of the United States Green Building Council, with a description of the LEED certification process and requirements for C&D waste recycling
www.epa.gov/epawaste/index.htm Site of the U.S. Environmental Protection Agency that discusses construction and demolition waste issues, and links to other resources.

1.7 SUBMITTALS:

- A. The Contractor shall be responsible for the development and implementation of a Waste Management Plan for the Project. The Contractor's subcontractors shall assist in the development of that Plan, and collect and deposit their waste and recyclable materials in accordance with the approved Plan.
- B. DRAFT WASTE MANAGEMENT PLAN. Within fifteen (15) days after receipt of 'Notice to Proceed', or prior to any waste removal, whichever occurs sooner, the Contractor shall submit to the Commissioner a Draft Waste Management Plan. Include separate sections for demolition and construction waste. The Plan shall demonstrate how the performance goals will be met, and contain the following:



1. List of materials targeted for reuse, salvage, or recycling, and names, addresses, and phone numbers of receiving facilities/companies that will be purchasing or accepting each material.
 2. Description of onsite and/or offsite sorting methods for all materials to be removed from site.
 3. If mixed construction and demolition waste is to be sorted off-site, provide a letter from the processor stating the average percentage of mixed construction and demolition waste they recycle.
 4. Landfill information: Names of landfills where non-recyclable/reusable/salvageable waste will be disposed, and list of applicable tipping fees.
 5. Materials handling procedures: A description of the means by which any-recyclable, salvaged, or reused materials will be protected from contamination, and collected in a manner that will meet the requirements for acceptance by the designated recycling processors.
 6. Transportation: A description of the means of transportation and destination for recycled materials.
 7. Meetings: Description of regular meetings to be held to address waste management.
 8. Sample spreadsheet and description of how the implementation of the plan will be documented on a monthly basis.
- C. **FINAL WASTE MANAGEMENT PLAN.** Within fifteen (15) days of Commissioner's approval of the Draft Plan, the Contractor shall submit a Final Waste Management Plan.
- D. **PROGRESS REPORTS.** The Contractor shall submit monthly a Waste Management Progress Report, containing the following information:
1. Project title, name of company completing report, and dates of period covered by the report
 2. Report on the disposal of all jobsite waste. A DDC C&D Waste Management Log form is available on the DDC Sustainable Design website and included at the end of this section. For each shipment of material removed from the site, provide the following:
 - a. Date and ticket number of removal
 - b. Identity of material hauler
 - c. Material Category
 - d. Total quantity of waste, in tones/cubic yards, by type
 - e. Quantity of waste salvaged, recycled and/or reused, by type
 - f. Total quantity of waste diverted from landfill (recycled, salvaged, reused) as a percentage of total waste
 - g. Recipient of each material type
 3. Provide monthly and cumulative project totals of waste, quantity diverted, and percentage diverted.
 4. Note that the unit of measure may be either tons or cubic yards, but must be consistent for all shipments and all materials throughout the project. Reports with inconsistent or mixed units will not be reviewed and will be returned for re-submission.
 5. Include legible copies of on-site logs, weight tickets and receipts. Receipts shall be from charitable organizations, recycling and/or disposal site operators who can legally accept the materials for the purpose of reuse, recycling or disposal. Contractor shall save such original documents for the life of the project plus seven (7) years.
- E. **LEED Submittal:** For LEED designated projects submit LEED Letter Template for Credit 2.2, signed by the Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.
- F. **Refrigerant Recovery.** Submit Qualification data for Refrigerant recovery technician. Statement of refrigerant recovery, signed by the refrigerant recovery technician responsible for recovering refrigerant



stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.8 QUALITY ASSURANCE:

- A. The Contractor shall designate a Waste Management Coordinator, to ensure compliance with this section. Coordinator shall be present at Project site full time for the duration of the project.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Waste management plans, documentation and implementation shall be discussed at the following meetings:
 - 1. Pre-demolition kick-off meeting
 - 2. Pre-construction kick-off meeting
 - 3. Regular job-site meetings
 - 4. Contractor toolbox meetings

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 WASTE PLAN IMPLEMENTATION:

- A. The Contractor shall implement the Waste Management Plan, coordinate the Plan with all affected trades, and designate one individual as the Construction Waste Management Representative, who will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis, and for assembling the required LEED documentation.
- B. The Contractor shall be responsible for the provision of containers and the removal of all waste, non-returned surplus materials, and rubbish from the site in accordance with the approved Waste Management Plan. The Contractor shall oversee and document the results of the Plan. Monies received for salvaged materials shall remain with the Contractor, except the monies for those items specifically identified elsewhere in the specifications, or indicated on the drawings as belonging to others.
- C. Responsibilities of Subcontractors: Each subcontractor shall be responsible for collecting its waste, non-returned surplus materials, and rubbish, in accordance with the Waste Management Plan.
- D. Distribution. The Contractor shall distribute copies of the Waste Management Plan to each Subcontractor, Resident Engineer, Construction Manager, and Commissioner.
- E. Instruction: The Contractor shall provide on-site instruction of proper waste management procedures to be used by all parties in appropriate stages of the Project.
- F. Procedures. Conduct waste management operations to ensure minimum interference with site vegetation, roads, streets, walks and other adjacent occupied and used facilities.
 - 1. Collect co-mingled waste and/or separate all recyclable waste in accordance with the Plan. Specific areas on the Project site are to be designated, and appropriate containers and bins clearly marked with acceptable and unacceptable materials.
 - 2. Inspect containers and bins for contamination and remove contaminated materials if found.



3. Comply with the General Conditions for controlling dust and dirt, environmental protection, and noise control.

3.2 ADDITIONAL DEMOLITION AND SALVAGE REQUIREMENTS:

- A. Demolition and salvage of additional items indicated in other sections of the Project Specifications require special attention as part of the overall 75 % diversion from landfill. Specific requirements for special attention are designated in other sections of the Project Specifications.

3.3 DISPOSAL:

- A. General. Except for items or material to be salvaged, recycled or otherwise reused, remove waste material from the Project site and legally dispose of them in a manner acceptable to authorities having jurisdiction.
 1. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning. Do not burn waste materials
- C. Disposal. Transport waste materials off Project Site and legally dispose of them.

END OF SECTION 01 74 19



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT LOG

No Text



**SECTION 01 77 00
CLOSEOUT PROCEDURES**

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section includes administrative and general procedural requirements for Closeout Procedures, including without limitation the following:
1. Definitions
 2. Substantial Completion
 3. Final Acceptance
 4. Warranties
 5. Final Cleaning
 6. Repair of the Work
- B. LEED: Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS."
- C. COMMISSIONING: Refer to the Addendum to identify whether this project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED- NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 33 00 SUBMITTAL PROCEDURES
- C. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT & DISPOSAL
- D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
- E. Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or



combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

- C. Substantial Completion: shall mean the written determination by the Commissioner that the Work required under the Contract is substantially, but not entirely, complete.
- D. Final Acceptance: shall mean final written acceptance of all the Work by the Commissioner, a copy of which shall be sent to the Contractor.

1.5 SUBSTANTIAL COMPLETION:

- A. Preliminary Procedures: Before requesting inspection to determine the date of Substantial Completion, the Contractor shall complete and supply all items required by the contract specifications, General Conditions, Addendum to the General Conditions, change orders or other directives from the Commissioner's representatives. The required items will include all contract requirements for substantial completion, including but not limited to items related to releases, regulatory approvals, warranties and guarantees, record documents, testing, demonstration and orientation, final clean up and repairs, and all specific checklist of items by the Resident Engineer. (See Attachment "A" at the end of this section for sample requirements for Substantial Completion).
- B. Prepare and submit a list to the Resident Engineer of incomplete items, the value of incomplete construction, and reasons the work is not complete.
- C. Inspection: The Contractor shall submit to the Resident Engineer a written request for inspection for Substantial Completion. Within ten (10) days of receipt of the request, the Resident Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. The Resident Engineer may request the services, as required, of the Design Consultant, Client Agency Representative and/or other entities having involvement with the Work to assist in the inspection of the Work. If the Resident Engineer makes a determination that the work is substantially complete and approves the Final Punch List and the date for Final Acceptance, he/she will so advise the Commissioner and recommend issuance of the Certificate of Substantial Completion. If the Resident Engineer determines that the work is not substantially complete, he/she will notify the Contractor of those items that must be completed or corrected before the Certificate of Substantial Completion will be issued.
 - 1 Re-inspection: Contractor shall request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2 Results of completed inspection will form the basis of requirements for Final Acceptance.

1.6 FINAL ACCEPTANCE:

- A. Preliminary Procedures: Before requesting final inspection for Final Acceptance of the Work, the Contractor shall complete the following. (Note that the following are to be completed, submitted as appropriate, and approved by the Commissioner, as applicable, prior to the final inspection and are not to be submitted for approval or otherwise at the final inspection unless specifically indicated). List exceptions in the request.
 - 1. Verify that all required submittals have been provided to the Commissioner including but not limited to the following:
 - a. Manufacturer's cleaning instructions
 - b. Posted instructions
 - c. As-built Record Documents (Drawings, specifications, and product data) as described in Section 01 78 39, CONTRACT RECORD DOCUMENTS, incorporating any changes required by the Commissioner as a result of the review of the submission prior to the pre-final inspection.
 - d. Operation and Maintenance Manuals, including Preventive Maintenance, Special Tools, Repair Requirements, Parts List, Spare Parts List, and Operating Instructions.



- e. Completion of required Demonstration and Orientation, as applicable, of designated personnel in operation and maintenance of systems, sub-systems and equipment.
 - f. Applicable LEED Building submittals as described in Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS.
 - g. Construction progress photographs as described in Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION.
2. Submit a certified copy of the final approved Punch List of items to be completed or corrected. The certified copy of the Punch List shall state that each item has been completed or otherwise resolved for acceptance, and shall be endorsed and dated by the Contractor.
 3. Submit pest-control final inspection report and survey as required in Section 01 50 00, TEMPORARY FACILITIES AND CONTROLS.
 4. Submit record documents and similar final record information.
 5. Deliver tools, spare parts, extra stock and similar items.
 6. Complete final clean-up requirements including touch-up painting of marred surfaces.
 7. Submit final meter readings for utilities, as applicable, a measured record of stored fuel, and similar data as of the date when the City took possession of and assumed responsibility for corresponding elements of the work.
- B. Final Inspection: The Contractor shall submit to the Resident Engineer a written request for inspection for Final Acceptance of the Work. Within ten (10) days of receipt of the request, the Resident Engineer will either proceed with inspection or notify the Contractor of unfulfilled requirements. The Resident Engineer may request the services, as required, of the Design Consultant, Client Agency Representative and/or other entities having involvement with the Work to assist in the inspection of the Work. If the Resident Engineer finds that all items on the Final Approved Punch List are complete and no further work remains to be done, he/she will so advise the Commissioner and recommend the issuance of the determination of Final Acceptance. If the Resident Engineer determines that the work is not complete, he/she will notify the Contractor of those items that must be completed or corrected before the determination of Final Acceptance will be issued.
- C. Final Acceptance: The Work will be accepted as final and complete as of the date of the Resident Engineer's inspection if, upon such inspection, the Resident Engineer finds that all items on the Punch List are complete and no further Work remains to be done. The Commissioner will then issue a written determination of Final Acceptance.

1.7 WARRANTIES:

- A. The items of materials and/or equipment for which manufacturer warranties are required are listed in Schedule B of the Addendum. For each item of material and/or equipment listed in Schedule B, 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 in Schedule B and will be replaced or repaired within such specified period. The contractor shall deliver all required warranties to the Commissioner.
- B. Unless indicated otherwise Warranties are to take effect on the date of Substantial Completion.
- C. Submittal Time: Submit written Warranties on request of the Commissioner for designated portions of the Work where commencement of Warranties other than date of Substantial Completion is indicated.
- D. Partial Occupancy: Submit properly executed Warranties to the Commissioner within 15 days of completion of designated portions of the Work that are completed and occupied or used by the City.
- E. Organize the Warranty documents into an orderly sequence based on the Project Specification Divisions and Section Numbers.



1. Bind Warranties in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES;" name and location of Project; Capitol Budget Project Number (FMS ID); and Contractor's and applicable subcontractor's name and address.
 3. Provide heavy paper dividers with plastic-covered tabs for each separate Warranty. Mark tab to identify the product or installation.
 4. Provide a typed description of each product or installation being warranted, including the name of the product, and the name, address, and telephone number of the Installer.
- F. When warranted materials and/or equipment require operation and maintenance manuals, provide additional copies of each required Warranty in each required manual. Refer to Section 01 78 39, CONTRACT RECORD DOCUMENTS, for requirements of Operation and Maintenance Manuals.

PART II – PRODUCTS

2.1 MATERIALS:

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART III – EXECUTION

3.1 FINAL CLEANING:

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations, as applicable, before requesting inspection for Final Acceptance of the Work for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.



- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to unusual operating conditions.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - s. Leave Project clean and ready for occupancy.
 - t. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests, as required in Section 01 50 00, TEMPORARY FACILITIES, SERVICES AND CONTROLS. Prepare and submit a Pest Control report to the Commissioner.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on City's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

3.2 REPAIR OF THE WORK:

- A. Subject to the terms of the Contract the Contractor shall complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Contractor shall repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.



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3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

CLOSEOUT PROCEDURES

01 77 00 -6



SECTION 01 77 00

ATTACHMENT 'A'

The following list is a general sample of Substantial Completion requirements, including but not limited to:

1. Prepare and submit a list to the Resident Engineer, of incomplete items, the value of incomplete construction, and reasons the work is not complete.
2. Obtain and submit any necessary releases enabling the City unrestricted use of the project and access to services and utilities.
3. Regulatory Approvals: Submit all required documentation from applicable Governing Authorities, including, but not limited to, Department of Buildings (DoB); Department of Transportation (DoT); Department of Environmental Protection (DEP); Fire Department (FDNY); etc. Documentation to include, but not limited to, the following:
 - a. Building Permits, Applications and Sign-offs.
 - b. Permits and Sign-off for construction fences; sidewalk bridges; scaffolds, cranes and derricks; utilities; etc.
 - c. Certificates of Inspections and Sign-offs.
 - d. Required Certificates and Use Permits.
 - e. Certificate of Occupancy (C.O.), Temporary Certificate of Occupancy (T.C.O.) or Letter of Completion as applicable.
4. Submit specific warranties required by the specifications, final certifications, and similar documents.
5. Prepare and submit Record Documents as described in Section 01 78 39, CONTRACT RECORD DOCUMENTS, including but not limited to; approved documentation from Governing Authorities; as-built record drawings and specifications; product data; operation and maintenance manuals; Final Completion construction photographs; damage or settlement surveys; final property surveys; and similar final record information. The Resident Engineer will review the submission and provide appropriate comments. If comments are significant the initial submission will be returned to the Contractor for correction and re-submission incorporating the comments prior to the Final Inspection.
6. Record Waste Management Progress Report: Submit C&D Waste Management logs, with legible copies of weight tickets and receipts required in accordance with Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
7. If applicable submit LEED Letter Template in accordance with the requirements of Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS.
8. Schedule applicable Demonstration and Orientation required in other Sections of the Project Specifications and as described in Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.
9. Deliver tools, spare parts, extra materials, and similar items to location designated by Resident Engineer. Label with manufacturer's name and model number where applicable.
10. Make final changeover of permanent locks and deliver keys to the Resident Engineer. Advise Commissioner of changeover in security provisions.
11. Complete startup testing of systems as applicable.
12. Submit approved test/adjust/balance records.
13. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements as directed by the Resident Engineer.
14. If applicable complete Commissioning requirements as defined in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS.
15. Complete final cleaning requirements, including touchup painting.
16. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.



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No Text

CLOSEOUT PROCEDURES
01 77 00 -8



SECTION 01 78 39
CONTRACT RECORD DOCUMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section includes administrative and general procedural requirements for Contract Record Documents, including:
1. As-built Contract Record Drawings.
 2. As-built marked-up copies of Record Specifications, addenda and Change Orders.
 3. As-built marked-up Product Data
 4. Record Samples
 5. Construction Record Photographs
 6. Operating and Maintenance Manuals
 7. Final Site Survey
 8. Guarantees and Warranties
 9. Waste Disposal Documentation
 10. LEED Materials and Matrix
 11. Miscellaneous Record Submittals
- B. The Department of Design and Construction, at the start of construction (kick-off meeting), will furnish to the Contractor at no cost a complete set of Contract Drawings Mylars (reproducible) pertaining to the work to be performed under the Contract. It is the responsibility of the 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 (reproducible) drawings, if necessary, such as Addenda Drawings and Supplementary Drawings as may be necessary to indicate all work in detail as actually completed. All professional seals must be blocked out. Title box complete with project title and Design Consultants' names will remain.
- C. Maintenance of Documents and Samples: The Contractor shall maintain, during the progress of the work, an accurate record of the work as actually installed, on Contract Record Drawings, on Mylar (reproducible), in ink. Store record documents and samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and samples available at all times for the Resident Engineer's inspections.

The Contractor's attention is particularly directed to the necessity of keeping accurate records of all subsurface and concealed work, so that the Contract Record Drawings contain this information in exact detail and location. Contract Record Drawings shall also show all connections, valves, gates, switches, cut-outs and similar operating equipment.

For projects designated to achieve a LEED rating the Contractor shall receive a copy of the project's LEED scorecard for the purpose of monitoring compliance with the target objectives and to facilitate coordination with the LEED Consultant. The Contractor shall receive periodic updates of this scorecard,



and is required to submit the final version of the Scorecard at Substantial Completion with other project Record Documents.

1.3 RELATED SECTIONS: include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
- C. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
- D. Section 01 33 00 SUBMITTAL PROCEDURES
- E. Section 01 77 00 PROJECT CLOSEOUT PROCEDURES

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

- A. As-Built Contract Record Drawings: Comply with the following:
 1. Progress Submission: As directed by the Resident Engineer, submit progress As-Built Contract Record Drawings at the 50% Construction Completion stage.
 2. Final Submission: Before substantial completion payment, the Contractor shall furnish to the Commissioner one (1) complete set of marked-up Mylar (reproducible) As-Built Contract 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 the sponsoring agency by DDC.
 3. As-Built Contract 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 for binding.
 4. Each As-Built Contract Record Drawing shall bear the legend "AS-BUILT CONTRACT RECORD DRAWING" in heavy block lettering, one half (1/2) inch high, and contain the following data:

AS-BUILT CONTRACT RECORD DRAWING

Contractor's Name _____
 Contractor's Address _____
 Subcontractor's Name (where applicable) _____
 Subcontractor's Address _____
 Made by: _____ Date _____
 Checked by: _____ Date _____

Commissioner's Representatives
 (Resident Engineer) DDC
 (Plumbing Inspector) DDC
 (Heating & Ventilating Inspector) DDC
 (Electrical Inspector) DDC



5. Record Drawing Title Sheet: The Contractor shall prepare a title sheet, the same size as the Contract Record Drawings, which shall contain the following:
 - a. Heading:
The City of New York
Department of Design and Construction
Division of Public Buildings
 - b. Capital Budget Project Number (FMS ID)
 - c. Name and Location of Project
 - d. Contractor's Name and Address
 - e. Subcontractor's Name and Address (where applicable)
 - f. Record of changes (a caption description of work affected, and the date and number of Change Order or other authorization)
 - g. List of Record Drawings
- B. Record Specifications, Addenda and Change Order: Submit to the Commissioner two (2) copies each of marked-up Record Specifications, Addenda and Change Orders.
- C. Record Product Data: Submit to the Commissioner two (2) sets of Record Product Data.
- D. Record Construction Photographs: Submit to the Commissioner final as-built construction photographs and negatives of the completed work as described in Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION.
- E. Operating and Maintenance Manuals:
 1. Submit three (3) copies each of preliminary manuals to the Resident Engineer for review and approval. The Contractor shall make such corrections, changes and/or additions to the manual until deemed satisfactory by the Resident Engineer. Deliver three (3) copies of the final approved manuals to the Resident Engineer for distribution.
 2. Commissioning: Comply with the requirements of Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS, as well as the requirements set forth in sections of the Project Specifications, for projects designated for Commissioning. Submit four (4) copies each of data designated to be included in the Commissioning Operation and Maintenance Manual to the Resident Engineer. The Resident Engineer will forward such data to the Commissioning Authority/Agent (CxA) for review and comment. The Contractor shall make such corrections, changes and/or additions to the data until deemed satisfactory and deliver four (4) copies of the final data to the Resident Engineer for use by the Commissioning Authority/Agent (CxA) to prepare the Commissioning Operation and Maintenance Manual.
 - a. Non-Commissioning Data: All remaining data not designated for Commissioning and required as part of Maintenance and Operation Manual shall be prepared and assembled in accordance with the requirements of this section for Operating and Maintenance Manuals.
- F. Final Site Survey: Submit Final Site Survey as described in Section 01 73 00, EXECUTION, in quantities requested by the Commissioner, signed and sealed by a Land Surveyor licensed in the State of New York.
- G. Guarantees and Warranties.
- H. Waste Disposal Documents and Miscellaneous Record Documents.



PART II – PRODUCTS

2.1 CONTRACT RECORD DRAWINGS:

- A. Record Prints: The Contractor shall maintain one set of blue- or black-line white prints as applicable of the Contract Drawings and Shop Drawings. If applicable, the Record Contract Drawings and Shop Drawings shall incorporate the arrangement of the work based on the accepted Master Coordination Drawing(s) as described in Section 01 33 00, SUBMITTAL PROCEDURES.
1. Preparation: The Contractor shall mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 2. Change Orders: 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.
- B. Content: Types of items requiring marking include, but are not limited to, the following:
1. Dimensional changes to Drawings.
 2. Revisions to details shown on Drawings.
 3. Depths of foundations below first floor.
 4. Locations and depths of underground utilities.
 5. Revisions to routing of piping and conduits.
 6. Revisions to electrical circuitry.
 7. Actual equipment locations.
 8. Duct size and routing.
 9. Locations of concealed internal utilities.
 10. Changes made by Change Order
 11. Changes made following Commissioner's written orders.
 12. Details not on the original Contract Drawings.
 13. Field records for variable and concealed conditions.
 14. Record information on the Work that is shown only schematically.
- C. Progress Record Mylar's (reproducible): As directed by the Resident Engineer at 50% construction completion, review marked-up Record Prints with the Resident Engineer and the Design Consulting. When directed by the Resident Engineer transfer progress mark-ups to a full set of Mylar's (reproducible) and submit one blue line or black line record copy to the Resident Engineer. The marked-up Mylar's (reproducible) shall be retained by the contractor for completion of mark-up and final submission.
- D. Final Contract Record Mylar's (reproducible): Immediately before final inspection for Certificate of Substantial Completion, review marked-up Record Prints with the Resident Engineer and the Design Consulting. When authorized, complete mark-up of a full set of corrected Mylar's (reproducible) of the Contract Drawings.
1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
 2. Refer instances of uncertainty to Resident Engineer for resolution.
 3. Print the As-Built Contract Drawings and Shop Drawings for use as Record Transparencies as described in Sub-Section 1.5.



2.2 RECORD SPECIFICATIONS, ADDENDA AND CHANGE ORDERS:

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made
 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 5. Note related Change Orders and Record Drawings where applicable.
 6. Upon completion of mark-up, submit two (2) complete copies of the marked-up Record Specifications to the Commissioner.

2.3 RECORD PRODUCT DATA:

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. If possible, a Change Order proposal should include resubmitting updated Product Data. This eliminates the need to mark up the previous submittal.
 4. Note related Change Orders and Record Drawings where applicable.
 5. Upon completion of mark-up submit to the Commissioner two (2) sets of the marked-up Record Product Data.
 6. Where Record Product Data is required as part of Maintenance Manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.

2.4 RECORD SAMPLE SUBMITTAL:

- A. Prior to the date of Substantial Completion, the Contractor shall meet with the Resident Engineer at the site to determine which of the Samples maintained during the construction period shall be transmitted to the Commissioner for record purposes.
- B. Comply with the Resident Engineer's instructions for packaging, identification marking and delivery to DDC. Dispose of other samples as specified for disposal of surplus and waste material.

2.5 OPERATING AND MAINTENANCE MANUALS:

- A. The Contractor shall provide preliminary and final versions of Operating and Maintenance Manuals required for those systems, equipment and materials listed in other Sections of the Project Specifications.
- B. Format: Prepare and assemble Operation and Maintenance Manuals in heavy-duty, 3-ring, hardback loose leaf binders in the form of an instructional manual. All binders for each discipline shall be the same color. When multiple binders are used, correlate data into related consistent groupings. Binder front shall contain permanently attached labels displaying the following:



1. Heading:
The City of New York
Department of Design and Construction
Division of Public Buildings
 2. Capital Budget Project Number (FMS ID)
 3. Name and Location of Project
 4. Contractor's name and Address
 5. Subcontractor's Name and Address (where applicable)
 6. Dates of the work covered by the contents of the Project Manual.
 7. Binder spine shall display Project Number (FMS ID) and date of completion.
- C. Organization: Include a section in the directory for each of the following:
1. List of documents
 2. List of systems
 3. List of equipment
 4. Table of contents
- D. Arrange content by systems under Specification Section numbers and sequence of Table of Contents of the Project manual. Provide tabbed flyleaf for each separate product, equipment and/or system/subsystem with typed description of product and major component parts of equipment.
- E. Safety warnings or cautions shall be visibly highlighted within each maintenance procedure. Use of such highlights shall be limited to only critical items and shall not be used in an excessive manner which would reduce their effectiveness.
- F. For each product or system, list names, addresses and telephone numbers of Subcontractors and Suppliers, including local source of supplies and replacement parts. Vendors and Supplier listings are to include names, addresses and telephone numbers, including nearest field service telephone numbers.
- G. Where contents of the manual include any manufacturer's catalog pages, clearly indicate the precise items and options included in the installation and delete all manufacturers' data regarding products not included in the installation.
- H. All material within manuals shall be new. Copies used for prior submittals or used in construction shall not be used.
- I. Submit preliminary and final manual editions to the Commissioner according to the approved progress schedule.
- J. Manuals shall present all technical material to the greatest extent possible, with respect to text, tabular matter and illustrations. Illustrations shall preferably consist of line drawings. All applicable drawings shall be included. If available, color photograph prints may be included.
- K. Preliminary manual editions shall be as technically complete as the final manual edition. All illustrations shall be in final forms.
- L. Final manual editions shall be technically accurate and complete and shall represent all "as-built" systems, pieces of equipment, or materials, which have been accepted by the Commissioner. All illustrations, text and tabular material shall be in final form. All shop drawings shall be included as specified in individual Specification Sections.
- M. Building products, applied materials, and finishes: Include product data, with catalog number, size, composition, and color texture designations. Where applicable, provide information for re-ordering custom manufactured products.
- N. Instructions for care and maintenance: Include manufacturers' recommendations for cleaning agents and methods, and recommended schedule for cleaning and maintenance.



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- O. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical compositions, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- P. Additional Requirements: Specified in individual Specification Sections.

2.6 DEMONSTRATION AND ORIENTATION DVD:

- A. Non-Commissioned Projects: The Contractor shall submit final version of applicable Demonstration and Training DVD recordings in compliance with Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

2.7 GUARANTEES AND WARRANTIES:

- 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.
- B. FORM – For all guarantee requirements set forth in Schedule B, the Contractor shall provide a written guaranty, in the form set forth herein.
- C. Submit fully executed and signed manufacturers' Warranties as listed in the Project Specifications and outlined in Schedule B of the Addendum. Refer to Section 01 77 00, CLOSEOUT PROCEDURES for submittal requirements.



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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: _____
Signature of Partner or Corporate Officer

Print Name: _____

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

Notary Public



2.8 WASTE DISPOSAL DOCUMENTATION:

- A. Certify and deliver to the Commissioner all documentation including reports, receipts, certificates, records etc. for the collection, handling, storage, classification, testing, transportation, recycling and/or disposal of all Non-Hazardous Construction Waste as required by Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, and Hazardous Waste as required by other Project Specification Sections. Certify compliance with all applicable governing laws, codes, rules and regulations.

2.9 MISCELLANEOUS RECORD DOCUMENTS:

- A. Refer to other Project Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Prior to Final Acceptance, complete miscellaneous records and place in good order, properly identified and bound or otherwise organized to allow for use and reference.
- B. Submit three (3) copies of each document to the Commissioner or as otherwise directed by the Commissioner.

PART III – EXECUTION

3.1 RECORDING AND MAINTENANCE:

- A. Recording: Maintain one copy of each submittal during the construction period for Contract Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Contract Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to the Contract Record Documents for the Resident Engineer's reference during normal working hours.

END OF SECTION 01 79 39



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CONTRACT RECORD DOCUMENTS
01 78 39- 10



SECTION 01 79 00
DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 79 00

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section includes administrative and procedural requirements, when set forth in sections of the Project Specifications, for instructing facility's personnel, including the following:
1. Demonstration of operation of systems, subsystems, and equipment.
 2. Owner's Pre-Acceptance Orientation in operation and maintenance of systems, subsystems, and equipment.
 3. Demonstration and Orientation videotapes. (Non-Commissioned Projects)
- B. The Contractor shall provide the services of equipment manufacturers orientation specialists experienced in the type of equipment to be demonstrated.
- C. Separate Orientation sessions shall be conducted for mechanical operations and maintenance personnel and for electronic and electrical maintenance personnel.
- D. Commissioning: Refer to the Addendum to identify whether this project is to be Commissioned. For Commissioned projects the Contractor shall provide Demonstration and Orientation as described in this section and cooperate with the Commissioning Authority/Agent (CxA) to implement Commissioning requirements as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS.

1.3 RELATED SECTIONS: include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 33 00 SUBMITTAL PROCEDURES
- C. Section 01 77 00 CLOSEOUT PROCEDURES
- D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
- E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS
- F. Specific requirements for demonstration and training indicated in other sections of the Project Specifications

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.



- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

- A. Instruction Program: Submit three (3) copies of outline of instructional program for demonstration and orientation, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each orientation module to the Commissioner for approval no less than thirty (30) days prior to the date the proposed orientation is to take place. Include learning objectives and outline for each orientation module.
1. At completion of training, submit three (3) complete training manual(s) and three (3) applicable DVD recording(s) to the Commissioner for the facility's and City's use.
- B. Qualification Data: For facilitator, instructor and Videographer.
- C. Attendance Record: For each orientation module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each orientation module, submit results and documentation of performance-based test.
- E. Submit all final orientation material to the Resident Engineer a minimum of fourteen (14) days prior to the scheduled training.
- F. Demonstration and Orientation Recordings:
1. Non-Commissioned Projects:
 - a. The Contractor shall submit to the Commissioner three (3) copies of Demonstration and Orientation DVD (Digital Video Disk) recordings within seven (7) days of end of each training module.
 - b. Identification: On each copy, provide an applied label with the following information:
 - 1) Project Contract I.D. Number
 - 2) Project Contract Name
 - 3) Name of Contractor
 - 4) Name of Subcontractor as applicable
 - 5) Name of Design Consultant
 - 6) Name of Construction Manager as applicable
 - 7) Date recorded.
 - 8) Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - 9) Table of Contents including list of systems covered.
 - c. Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding DVD recording. Include name of Project and date of recording on each page.
 2. Commissioned Projects:
 - a. Demonstration and Orientation DVD recordings for Commissioned projects will be recorded by the Commissioning Authority/Agent (CxA) under separate contract with the City of New



York. The Contractor performing Demonstration and Orientation shall cooperate with the CxA in the recording of each Demonstration and Orientation module.

1.6 QUALITY ASSURANCE:

- A. Facilitator Qualifications: A firm or individual experienced in orientation or educating maintenance personnel in an orientation program similar in content and extent to that indicated for this Project.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00, QUALITY REQUIREMENTS, experienced in operation and maintenance procedures and orientation.
- C. Videographer Qualifications: A professional Videographer who has experience with orientation and construction projects.
- D. Pre-instruction Conference: Schedule with the Resident Engineer a conference at Project site to comply with requirements in Section 01 31 00, PROJECT MANAGEMENT AND COORDINATION. Review methods and procedures related to demonstration and orientation including, but not limited to, the following:
 - 1. Inspect and discuss locations and other facilities required for instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 - 3. Review required content of instruction.
 - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.7 COORDINATION:

- A. Coordinate instruction schedule with the Resident Engineer and facility's operations. Adjust schedule as required to minimize disrupting facility's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of orientation modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by the Commissioner.

PART II – PRODUCTS

2.1 INSTRUCTION PROGRAM:

- A. Program Structure: Develop an instruction program that includes individual orientation modules for each system and equipment not part of a system, as specified and required by individual Specification Sections.
- B. Orientation Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.



- d. Regulatory requirements.
 - e. Equipment function including auxiliary equipment and systems.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project Record Documents.
 - e. Identification systems.
 - f. Warranties
 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning



- e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
 - h. Housekeeping practices
8. Repairs: Include the following:
- a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART III – EXECUTION

3.1 INSTRUCTION:

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and the Resident Engineer for the number of participants, instruction times, and location.
- B. The Contractor shall engage qualified instructors to instruct facility's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- C. Scheduling: Schedule instruction with the Resident Engineer at mutually agreed times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule orientation with the Resident Engineer with at least fourteen (14) days' advance notice.
- D. Evaluation: At conclusion of each orientation module, assess and document each participant's mastery of module(s) by use of an oral a written or a demonstration performance-based test.
- E. Cleanup: Collect and remove used and leftover educational materials from project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial orientation use.

3.2 DEMONSTRATION AND ORIENTATION RECORDINGS:

- A. Non-Commissioned projects:
 - 1. The Contractor shall engage a qualified commercial Videographer to record demonstration and orientation sessions. Record each orientation module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 2. At beginning of each orientation module, record each chart containing learning objective and lesson outline.
 - 3. All recordings must be close captioned.
 - 4. Recording Format: Provide high-quality DVD (Digital Video Disk) format.
 - 5. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and orientation. Display continuous running time.
 - 6. Narration: Describe scenes on the recording by audio narration by microphone while recording or by dubbing audio narration off-site after. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.



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7. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from opposite the corresponding narration segment.

B. Commissioned Projects:

Refer to the Addendum to determine if the project is to be Commissioned.

1. The Commissioning Authority/Agent (CxA) under separate contract with the City of New York will assess and comment on the adequacy of the Orientation Instruction sessions by reviewing the Orientation and Instruction program and agenda provided by each contractor. The provider of the Orientation program will videotape the sessions and provide a copy to the CxA for final review and comments. If necessary, Contractor shall edit the DVD recording per CxA comments.

END OF SECTION 01 79 00



SECTION 01 81 13
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. LEED BUILDING - GENERAL REQUIREMENTS:

The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED™ Green Building rating. Specific project requirements related to this goal are listed in the applicable paragraphs of this section of the General Conditions. The Contractor shall ensure that these requirements as defined in the sections below and in related sections of the Contract Documents, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

B. This Section includes:

1. Definitions
2. LEED Provisions
3. LEED Building Submittals
4. LEED Building Submittal Requirements
5. LEED Action Plan

1.3 RELATED SECTIONS: Include without limitation the following:

- | | | |
|----|---------------------|--|
| A. | Section 01 74 19 | CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL |
| B. | Section 01 81 13.13 | VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES,
SEALANTS, PAINTS AND COATINGS |
| C. | Section 01 81 19 | INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS |
| D. | Section 01 91 13 | GENERAL COMMISSIONING REQUIREMENTS |

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Agrifiber Products: Products derived from recovered agricultural waste fiber from sources such as cereal straw, sugarcane bagasse, sunflower husk, walnut shells, coconut husks, and agricultural prunings, processed and mixed with resins to produce panels with characteristics similar to composite wood.



- C. **Composite Wood:** Products composed of wood or plant particles or fibers bonded by a synthetic resin or binder to produce panels such as plywood, particleboard, and medium density fiberboard (MDF). Does not include hardboard, structural panels, glued laminated timber, prefabricated wood I-joists, or finger-jointed lumber.
- D. **Design Consultant:** "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
- E. **Forest Stewardship Council (FSC) Certified Wood:** Wood-based materials and products certified in accordance with the Forest Stewardship Council's principles and criteria.
- F. **LEED:** The Leadership in Energy & Environmental Design rating system developed by the United States Green Building Council.
- G. **Rapidly Renewable Materials:** Materials made from agricultural products that are typically harvested within a ten-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool.
- H. **Regionally Manufactured Materials:** Materials that are manufactured within a radius of 500 miles from the Project location. Manufacturing refers to the final assembly of components into the building product that is installed at the Project site.
- I. **Regionally Extracted, Harvested, or Recovered Materials:** Materials which are extracted, harvested, or recovered and manufactured within a radius of 500 miles from the Project site.
- J. **Recycled Content:** The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer).
1. Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials.
 2. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.
 3. "Pre-consumer" may also be referred to as "post-industrial".
- K. **Solar Reflectance Index (SRI):** A measure of a material's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is equal to 0, and a standard white (reflectance 0.80, emittance of 0.90) is equal to 100.
- L. **Volatile Organic Compound (VOC):** Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.



1.5 LEED PROVISIONS:

- A. Refer to the Addendum for the LEED rating to be achieved for this project. The provisions to achieve this LEED rating are integrated within the project construction documents and specifications. The Contractor is specifically directed to the "LEED BUILDING Performance Criteria" and "LEED BUILDING Submittals" sections within the contract specification. Additional LEED requirements are met through aspects of the project design, including material and equipment selections, which may not be specifically identified as LEED BUILDING requirements. Compliance with the requirements needed to obtain LEED prerequisites and credits will be used as one criterion to evaluate substitution requests.

1.6 LEED BUILDING SUBMITTALS:

- A. Scope: LEED BUILDING submittals are required for all installed materials included in General Construction work. LEED BUILDING Submittals are only required for field-applied adhesives, sealants, paints and coatings included in Plumbing, Mechanical and Electrical work. Submit all required LEED BUILDING submittals in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.
- B. Applicability: The extent of the LEED BUILDING Submittals varies depending on the specification section. Applicable LEED BUILDING Submittals are listed under the "LEED BUILDING Submittals" heading in each specification section. The detailed requirements for the LEED BUILDING Submittals are defined in Item C below.
- C. Detailed Requirements: Sub-Sections 1.6 C.1 through 1.6 C.3 below defines the information and documents to be provided for each type of LEED BUILDING Submittal as identified in the LEED Submittal Requirements of each specification section:
1. ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM (EBMCF)[GHI]: Information to be supplied for this form (blank sample copy attached at end of this Section to be modified as appropriate to the project) shall include some or all of the following items, as identified in the LEED Submittal Requirements of each specification section:
 - a. Cost breakdowns for the materials included in the contractor or sub-contractor's scope of work. Cost reporting shall include itemized material costs (excluding the contractor's labor, equipment, overhead and profit).
 - b. The percentages (by weight) of post-consumer and/or post-industrial recycled content in the supplied product(s).
 1. For each product with recycled content, also indicate the total recycled content value ($1/2 \times \text{pre-consumer percentage} \times \text{product value} + 1 \times \text{post-consumer percentage} \times \text{product value} = \text{total recycled content value}$).
 2. See additional requirements for concrete below.
 - c. Identification (Yes/No) of materials manufactured within 500 miles of the project site AND containing raw materials harvested or extracted within 500 miles of the project site.
 - 1) Indicate the percentage by weight, relative to the total weight of the product that meets these criteria.
 - 2) Indicate the point of harvest/extraction/recovery of regional raw materials, the point of final assembly of regional manufactured products, and the distance from each point to the project site.
 - d. Volatile Organic Compound (VOC) content of all field-applied adhesives, sealants, paints, and coatings, listed in grams/liter or lbs./gallon, less water.
 - 1) For detailed requirements refer to Section 01 81 13.13 VOC LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS.
 - e. The amount of "Forest Stewardship Council (FSC) Certified" wood products if used in the Project.
 - 1) Record only new FSC-certified wood products. Do not record reclaimed, salvaged, or recycled FSC-certified wood products.



- 2) Reclaimed, salvaged, or recycled FSC-certified wood may be recorded as post-consumer recycled content.
 - f. The amount of Rapidly Renewable materials if used in the Project.
 - 1) Indicate the type of rapidly renewable material used, and the percentage by weight, relative to the total weight of the product, that consists of rapidly renewable material.
 - g. The percentage (by weight), relative to the total weight of cementitious materials, of supplementary cementitious materials or pozzolans such as fly ash used in each concrete mix used in the Project.
 - 1) For each concrete mix, provide a complete breakdown of all components, by weight and by cost.
 - h. Identification (Yes/No) of composite wood or agrifiber products used in the project that are free of added urea-added formaldehyde resins.
 - i. Identification (Yes/No) of flooring products used in the project that have Carpet and Rug Institute (CRI) Green Label or Green Label Plus certification, or Resilient Floor Covering Institute FloorScore certification.
 - 1) Untreated solid wood flooring, and mineral-based flooring products such as tile, masonry, terrazzo, and cut stone that have no organic-based coatings or sealants, are excluded from this requirement.
 - j. The EBMcF shall record the above information only for those materials or products permanently installed in the project. The EBMcF shall record VOC content, composite and agrifiber products, and CRI or FloorScore ratings only for those materials or products permanently installed within the weather barrier of the LEED building.
2. **EBMcF BACK-UP DOCUMENTATION:** These documents are used to validate the information provided on the EBMcF (except cost data). For each material listed on the EBMcF, provide documentation to certify the material's LEED BUILDING attributes, as applicable:
- a. **RECYCLED CONTENT:** Provide published product literature or letter of certification on the manufacturer's letterhead certifying the amounts of post-consumer and/or post-industrial content.
 - b. **REGIONAL MANUFACTURING AND REGIONAL RAW MATERIALS (WITHIN 500 MILES):** Provide published product literature or letter of certification on the manufacturer's letterhead indicating the city/state where the manufacturing plant is located, where each of the raw materials in the product were extracted, harvested or recovered and the distance in miles from the project site.
 - 1) If only some of the raw materials for a particular product or assembly originate within 500 miles of the project site, provide the percentage (by weight) that these materials comprise in the complete product.
 - c. **VOC CONTENT:** Provide Material Safety Data Sheets (MSDS) certifying the Volatile Organic Compound (VOC) content of the adhesive, sealant, paint, or coating products. VOC content is to be reported in grams/liter or lbs./gallon, less water. If the MSDS does not show the product's VOC content, this information must be provided through other published product literature from the manufacturer, or stated in a letter of certification from the product manufacturer on the manufacturer's letterhead.
 - d. **RAPIDLY RENEWABLE MATERIALS:** If used in the project, provide published literature or letter of certification on the manufacturer's letterhead certifying the percentage of each product that is rapidly renewable (by weight).
3. **PRODUCT CUT SHEETS:** Provide product cut sheets with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project.
4. **CRI GREEN LABEL PLUS CERTIFICATION:** For carpets and carpet cushions, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the products comply with the "Green Label Plus" IAQ testing program of the Carpet and Rug Institute of Dalton, GA.



5. **CERTIFICATION OF COMPOSITE WOOD OR AGRIFIBER RESINS:** For all composite wood, engineered wood and agrifiber products (including plywood, particleboard, and medium density fiberboard), provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the products do not contain added urea-formaldehyde resins.
6. **CERTIFICATION OF COMPOSITE WOOD OR AGRIFIBER LAMINATING ADHESIVES:** For all laminating adhesives used with composite wood, engineered wood and agrifiber products (e.g., adhesives used to laminate wood veneers to an engineered wood substrate), provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the adhesive products do not contain urea-formaldehyde.
7. **FSC-CERTIFIED WOOD:**
 - a. If used in the project, provide chain of custody documents and copies of invoices regarding wood products, including whether or not such wood product is FSC-certified.
 - b. If used in the project, for assemblies, provide the percentage (by cost and by weight) of the assembly that is FSC-certified wood.
 - c. If used in the project, for assemblies, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the percentage that is FSC-certified wood.
8. **GREEN SEAL COMPLIANCE:** Provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the following product types comply with the VOC limits and chemical component restrictions developed by the Green Seal organization of Washington, DC:
 - a. Interior Architectural Paints and Coatings: refer to Green Seal standard GS-11 (1st edition, May 1993)
 - b. Anti-corrosive and Anti-rust paints: refer to Green Seal standard GC-03 (2nd Edition, January 1997)
 - c. Aerosol Adhesives: refer to Green Seal standard GS-36 (1st edition, October 2000)
9. **HIGH ALBEDO PAVING AND WALKWAY MATERIALS:** For paving and walkway materials made from concrete or brick provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying a minimum Solar Reflectance Index (SRI) value of 29. SRI values shall be calculated according to ASTM E 1980. Reflectance shall be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance shall be measured according to ASTM E 408 or ASTM C 1371.
10. **HIGH ALBEDO ROOFING MATERIALS:** For exposed roofing membranes, pavers, and ballast products, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following minimum Solar Reflectance Index (SRI) values:
 - a. 78 for low-sloped roofing applications (slope \leq 2:12)
 - b. 29 for steep-sloped roofing applications (slope $>$ 2:12)

SRI values shall be calculated according to ASTM E 1980. Reflectance shall be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance shall be measured according to ASTM E 408 or ASTM C 1371.

Vegetated roof surfaces are exempt from the SRI criteria.
11. **LOW MERCURY LAMPS:** For all fluorescent, compact fluorescent, and HID lamps installed in the project, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying:
 - a. The mercury content or content range per lamp in milligrams or picograms;
 - b. The design light output per lamp (light at 40% of a lamp's useful life) in lumens; and
 - c. The rated average life of the lamp in hours.



In addition, provide the total number of each lamp type installed in the project.

12. **FLOORSCORE CERTIFICATION:** For all hard surface flooring, including vinyl, linoleum, laminate flooring, wood flooring, ceramic flooring, rubber flooring, and wall base, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the products comply with the current FloorScore standard requirements.
13. **CONCRETE:** Provide concrete mix design for each mix, designated by a distinct identifying code or number and signed by a Professional Engineer licensed in the state in which the concrete manufacturer or supplier is located.
14. **INTERIOR LIGHTING FIXTURES:** For each lighting fixture type installed within the building's weather barrier, provide manufacturer's cut sheets indicating the following:
 - a. Fixture power in watts.
 - b. Initial lamp lumens.
 - c. Photometric distribution data.
 - d. Dimming capability, in range of percentages.
15. **EXTERIOR LIGHTING FIXTURES:** For each lighting fixture type installed on site, provide manufacturer's cut sheets indicating the following:
 - a. Fixture power in watts.
 - b. Initial lamp lumens.
 - c. Photometric distribution data.
 - d. Range of field adjustability, if any.
 - e. Warranty of suitability for exterior use.
16. **ALTERNATIVE TRANSPORTATION:** Provide manufacturer's cut sheets and/or shop drawings for the following items installed on site:
 - a. Bike racks, including total number of bicycle slots provided.
 - b. Signage indicating parking spaces reserved for electric or low-emitting vehicles and for carpools/vanpools, including total number of signs.
17. **WATER CONSERVING FIXTURES:** For all water consuming plumbing fixtures and fittings, provide manufacturer's cut sheets showing maximum flow rates and/or flush rates.
18. **ENERGY SAVING APPLIANCES:** Provide manufacturer's cut sheets and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the product's rating under the U.S. EPA/DOE Energy Star program, for all of the following:
 - a. Appliances (i.e., refrigerators, dishwashers, microwave ovens, televisions, clothes washers, clothes dryers, chilled water dispensers).
 - b. Office equipment (i.e., copy machines, fax machines, plotters/printers, scanners, binding and publishing equipment).
 - c. Electronics (i.e., servers, desktop computers, computer monitor displays, laptop computers, network equipment).
 - d. Commercial food service equipment
19. **GLAZING:** For glazing in any windows, doors, storefront and window wall systems, curtainwall systems, skylights, and partitions, provide manufacturer's cut sheets indicating the following:
 - a. Glazed area.
 - b. Visible light transmittance.
 - c. Solar heat gain coefficient.
 - d. Fenestration assembly u-factor.



20. VENTILATION: Provide manufacturer's cut sheets for the following:
- Carbon dioxide monitoring systems, if any, installed to measure outside air delivery.
 - Air filters: for detailed requirements refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS.
21. REFRIGERATION: For all refrigeration equipment, provide manufacturer's cut sheets indicating the following:
- Equipment type.
 - Equipment life. Default values specified by the 2007 ASHRAE Applications Handbook will be used unless otherwise demonstrated by the manufacturer's guarantee and an equivalent long-term service contract.
 - Refrigerant type.
 - Refrigerant charge in pounds of refrigerant per ton of gross cooling capacity.
 - Tested refrigerant leakage rate, in percent per year. A default rate of 2% will be used unless otherwise demonstrated by test data.
 - Tested end-of-life refrigerant loss, in percent. A default rate of 10% will be used unless otherwise demonstrated by test data.

1.7 LEED BUILDING SUBMITTAL REQUIREMENTS:

- A. The LEED BUILDING Submittal information shall be assembled into one package per contract specification section(s) (or per subcontractor), and submitted in accordance with Section 01 33 00, SUBMITTAL PROCEDURES. Incomplete or inaccurate LEED BUILDING submittals may be used as the basis for the rejection of products or assemblies. Incomplete or inaccurate LEED BUILDING Submittals may be used as the basis for rejecting the submitted products or assemblies.

1.8 LEED ACTION PLANS:

- A. Construction Waste Management Plan- Refer to Section 01 74 19, Construction Waste Management and Disposal for detailed submittal requirements.
- B. Construction IAQ Management Plan- Refer to Section 01 81 19, Indoor Air Quality Requirements for LEED Buildings, for detailed submittal requirements.
- C. Erosion and Sedimentation Control Plan:
- The Plan shall be in accordance with the New York State Department of Environmental Conservation (NYSDEC) or the 2003 EPA Construction General Permit, whichever is more stringent.
 - The Plan shall be submitted in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.
 - Detailed requirements: ESC Plan
 - Include the Stormwater Pollution Prevention Plan, if required.
 - Identify the party responsible for Plan monitoring and documentation. The party must be regularly on site.
 - Describe all site work that will be implemented on the project.
 - Provide site plan with location of ESC measures, including, but not limited to, stormwater quantity controls, stormwater quality controls, stabilized construction entrances, washdown areas, and inlet/catch basin protection.
 - Describe the inspection and maintenance of the ESC measures. Provide a construction schedule indicating weekly site review.
 - Describe reporting and documentation measures.
 - Detailed requirements: ESC Measures



5. Submittal requirements: ESC Tracking Log
 - a. Note date of major rain events, describe damage, describe any repairs or maintenance performed, and note responsible party.
 - b. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party.
 - c. Submit monthly.
6. Implementation
 - a. The Contractor shall implement the ESC Plan, coordinate the Plan with all affected trades, and designate one individual as the Erosion and Sedimentation Control Representative, who will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis, and for assembling the required LEED documentation.
 - b. The Contractor shall be responsible for the provision, maintenance, and repair of all ESC measures.
 - c. Demonstration. The Contractor shall provide on-site instruction of proper construction practices required to prevent erosion and sedimentation.
 - d. Meetings. Urgent or ongoing ESC issues shall be discussed at weekly on-site job meetings.

1.9 QUALITY ASSURANCE:

- A. The Contractor shall implement all LEED Action Plans, coordinate the Plans and LEED Building Submittals with all affected trades, and designate one individual as the Sustainable Construction Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of LEED activities with the Commissioner on a regular basis, and for assembling the required LEED documentation.
- B. Responsibilities of Contractor's Subcontractors: The Contractor shall be responsible for his/her subcontractors complying with the LEED Action Plans and for providing required LEED documentation as required for the project.
- C. Distribution and Compilation: The Contractor shall be responsible for distributing the EBMCF and any other forms or templates required for the subcontractors to record LEED documentation. The Contractor shall also be responsible for collecting and compiling EBMCF information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.
- D. Meetings: Sustainable design and construction issues shall be discussed at the following meetings:
 1. Demolition kick-off meeting
 2. Construction kick-off meeting
 3. Construction kick-off meeting for LEED (independent meeting)
 4. Weekly job-site progress and coordination meetings
 5. Closeout meeting

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13

NO TEXT



SECTION 01 81 13.13
VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

- A. This Section includes requirements for volatile organic compound (VOC) content in adhesives, sealants, paints and coatings used for the project.
- B. All sections in the Project Specifications with adhesives, sealant or sealant primer applications, paints and coatings shall follow all requirements of this section. In the event of any conflict or inconsistency between this section and the Specifications regarding adhesives, sealant or sealant applications, paints and coatings, the requirements set forth in this Section shall prevail.
- C. This Section includes:
 - 1. General Requirements
 - 2. References
 - 3. VOC Requirements for Interior Adhesives
 - 4. VOC Requirements for Interior Sealants
 - 5. VOC requirements for Interior Paints
 - 6. VOC requirements for Interior Coatings
 - 7. Submittals

1.3 RELATED SECTIONS: Include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
- C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
- D. Section 01 33 00 SUBMITTAL PROCEDURES
- E. Section 01 73 00 EXECUTION
- F. Section 01 77 00 CLOSEOUT PROCEDURES
- G. Section 01 78 39 CONTRACT RECORD DOCUMENTS
- H. Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS
- I. Section 01 81 19 INDOOR AIR QUALITY FOR LEED BUILDINGS

1.4 DEFINITIONS:

- A. **ADHESIVE:** Any substance used to bond one surface to another by attachment. Includes adhesive primers and adhesive bonding primers.
 - 1. **Aerosol Adhesive:** Any adhesive packaged as an aerosol with a spray mechanism permanently housed in a non-refillable can designed for hand-held application without the need for ancillary equipment.
- B. **CARCINOGEN:** A chemical listed as a known, probable, reasonably anticipated, or possible human



carcinogen by the International Agency for Research on Cancer (IARC) (Groups 1, 2A, and 2B), the National Toxicology Program (NTP) (Groups 1 and 2), the U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) (weight-of-evidence classifications A, B1, B2, and C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or the Occupational Safety and Health Administration (OSHA).

- C. **CLEAR WOOD FINISH:** Clear/semi-transparent coating applied to wood substrates to provide a transparent or translucent solid film.
1. **Lacquer:** Clear/semi-transparent coating formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and provide a solid, protective film.
 2. **Sanding Sealer:** A sanding sealer that also meets the definition of a lacquer.
 3. **Varnish:** Clear/semi-transparent coating, excluding lacquers and shellacs, formulated to dry by chemical reaction on exposure to air. May contain small amounts of pigment.
- D. **COATING:** Liquid, liquefiable, or mastic composition that is converted to a solid adherent film after application to a substrate as a thin layer; and is used for decorating, protecting, identifying or to serve some functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics; and is intended for on-site application to interior or exterior surfaces of buildings. Does not include stains, clear finishes, recycled latex paint, specialty (industrial, marine or automotive) coatings or paint sold in aerosol cans.
- E. **FLOOR COATING:** Opaque coating applied to flooring. Excludes industrial maintenance coatings.
- F. **HAZARDOUS AIR POLLUTANT:** Any compound listed by the U.S. EPA in the Clean Air Act Section 112(b)(1) as a hazardous air pollutant.
- G. **MUTAGEN:** A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be regarded as if they induce heritable mutations in the germ cells of humans, under the Harmonized System for the Classification of Chemicals Which Cause Mutations in Germ Cells (United Nations Economic Commission for Europe, Globally Harmonized System of Classification and Labeling of Chemicals).
- H. **OZONE-DEPLETING COMPOUNDS:** A compound with an ozone-depletion potential greater than 0.1 (CFC 11=1) according to the U.S. EPA list of Class I and Class II Ozone-Depleting Substances.
- I. **PAINT:** A pigmented coating. For the purposes of this specification, paint primers are considered to be paints.
1. **Flat Coating or Paint:** Has a gloss of less than 15 (using an 85-degree meter) or less than 5 (using a 60-degree meter).
 2. **Non-Flat Coating or Paint:** Has a gloss of greater than or equal to 15 (using an 85-degree meter) or greater than or equal to 5 (using a 60-degree meter).
 3. **Non-Flat High-Gloss Coating or Paint:** Has a gloss of greater than or equal to 70 (using a 60-degree meter).
 4. **Anti-Corrosive / Rust Preventative Paint:** Coating formulated and recommended for use in preventing the corrosion of ferrous metal substrates.
- J. **PRIMER:** Coating that is formulated and recommended for one or more of the following purposes: to provide a firm bond between the substrate and a subsequent coating; to prevent a subsequent coating from being absorbed into the substrate; to prevent harm to a subsequent coating from materials in the substrate; or to provide a smooth surface for application of a subsequent coating.
- K. **REPRODUCTIVE TOXIN:** A chemical listed as a reproductive toxin (including developmental, female, and male toxins) by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. Seq.).
- L. **SANDING SEALER:** Clear/semi-transparent coating formulated to seal bare wood. Can be abraded to create a smooth surface for subsequent coatings. Does not include sanding sealers that are lacquers (see Clear Wood Finish above).
- M. **SEALANT:** Any material with adhesive properties, formulated primarily to fill, seal, or waterproof gaps or joints



between surfaces. Includes sealant primers and caulks.

- N. SHELLAC: Clear or pigmented coating formulated solely with the resinous secretions of the lac beetle, thinned with alcohol and formulated to dry by evaporation without chemical reaction. Excludes floor applications.
- O. STAIN: Clear semi-transparent/opaque coating formulated to change the color but not conceal the grain pattern or texture of the substrate.
- P. VOLATILE AROMATIC COMPOUND: Any hydrocarbon compound containing one or more 6-carbon benzene rings, and having an initial boiling point less than or equal to 280 degrees Celsius measured at standard conditions of temperature and pressure.
- Q. VOLATILE ORGANIC COMPOUND: Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.
- R. WATERPROOFING SEALER: A coating that prevents the penetration of water into porous substrates.

1.5 GENERAL REQUIREMENTS:

- A. The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED Green building rating. Specific project requirements related to this goal which may impact this area of work are listed in the applicable paragraphs of this specification section. The Contractor shall ensure that the requirements as defined in the sections below and in related sections of the Contract Documents, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the stated environmental goals.

1.6 REFERENCES:

- A. Rule 1168 – “Adhesive and Sealant Applications”, amended 7 January 2005): South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov
- B. Rule 1113 - “Architectural Coatings”, amended 9 July 2004: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov
- C. Green Seal Standard GS-11- “Paints”, of Green Seal, Inc., Washington, DC, www.greenseal.org
- D. Green Seal Standard GC-03- “Anti-Corrosive Paints”, of Green Seal, Inc., Washington, DC, www.greenseal.org

1.6 VOC REQUIREMENTS FOR INTERIOR ADHESIVES, SEALANTS, PAINTS AND COATINGS:

- A. GENERAL: Unless otherwise specified herein, the VOC content of all interior adhesives, sealants, paints and coatings (herein referred to as “products”) shall not be in excess of **250 grams per liter**.
- B. No product shall contain any ingredients that are carcinogens, mutagens, reproductive toxins, persistent bioaccumulative compounds, hazardous air pollutants, or ozone-depleting compounds. An exception shall be made for titanium dioxide and, for products that are pre-tinted by the manufacturer, carbon black, which shall be less than or equal to 1% by weight of the product.
- C. No product shall contain the following:
 - 1. methylene chloride
 - 2. 1,1,1-trichloroethane
 - 3. benzene



- 4. toluene
- 5. ethylbenzene
- 6. vinyl chloride
- 7. naphthalene
- 8. 1,2-dichlorobenzene
- 9. di (2-ethylhexyl) phthalate
- 10. butyl benzyl phthalate
- 11. di-n-butyl phthalate
- 12. di-n-octyl phthalate
- 13. diethyl phthalate
- 14. dimethyl phthalate
- 15. isophorone
- 16. antimony
- 17. cadmium
- 18. hexavalent chromium
- 19. lead
- 20. mercury
- 21. formaldehyde
- 22. methyl ethyl ketone
- 23. methyl isobutyl ketone
- 24. acrolein
- 25. acrylonitrile

D. No product shall contain more than 1.0% by weight of sum total of volatile aromatic compounds.

1.8 VOC REQUIREMENTS FOR INTERIOR ADHESIVES:

- A. The volatile organic compound (VOC) content of adhesives, adhesive bonding primers, or adhesive primers used in this project shall not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California.
- B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.
- C. For specified building construction related applications, the allowable VOC content is as follows:

| | | |
|--------------------------------|------------------------------------|-----|
| 1. Architectural Applications: | | |
| a. | Indoor carpet adhesive | 50 |
| b. | Carpet pad adhesive | 50 |
| c. | Wood flooring adhesive | 100 |
| d. | Rubber floor adhesive | 60 |
| e. | Subfloor adhesive | 50 |
| f. | Ceramic tile adhesive | 65 |
| g. | VCT and asphalt tile adhesive | 50 |
| h. | Drywall and panel adhesive | 50 |
| i. | Cove base adhesive | 50 |
| j. | Multipurpose construction adhesive | 70 |
| k. | Structural glazing adhesive | 100 |
| 2. Specialty Applications: | | |
| a. | PVC welding | 510 |
| b. | CPVC welding | 490 |
| c. | ABS welding | 325 |
| d. | Plastic cement welding | 250 |

VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES
SEALANTS, PAINTS & COATINGS FOR LEED BUILDINGS



| | | |
|-------------------------------------|---|---------------------|
| e. | Adhesive primer for plastic | 550 |
| f. | Contact Adhesive | 80 |
| g. | Special Purpose Contact Adhesive | 250 |
| h. | Structural Wood Member Adhesive | 140 |
| i. | Sheet Applied Rubber Lining Operations | 850 |
| j. | Top and Trim Adhesive | 250 |
| 3. Substrate Specific Applications: | | |
| a. | Metal to metal | 30 |
| b. | Plastic foams | 50 |
| c. | Porous material (except wood) | 50 |
| d. | Wood | 30 |
| e. | Fiberglass | 80 |
| 4. Aerosol Adhesives: | | |
| a. | General purpose mist spray | 65% VOC's by weight |
| b. | General purpose web spray | 55% VOC's by weight |
| c. | Special purpose aerosol adhesives (all types) | 70% VOC's by weight |

1.9 VOC REQUIREMENTS FOR INTERIOR SEALANTS:

- A. The volatile organic compound (VOC) content of sealants, or sealant primers used in this project shall not exceed the limits defined in Rule 1168 – “Adhesive and Sealant Applications” of the South Coast Air Quality Management District (SCAQMD), of the State of California.
- B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

| | | |
|--------------------|---------------------------|-----|
| 1. Sealants: | | |
| a. | Architectural | 250 |
| b. | Non-membrane roof | 300 |
| c. | Roadway | 250 |
| d. | Single-ply roof membrane | 450 |
| e. | Other | 420 |
| 2. Sealant Primer: | | |
| a. | Architectural – Nonporous | 250 |
| b. | Architectural – Porous | 775 |
| c. | Other | 750 |

1.10 VOC REQUIREMENTS FOR INTERIOR PAINTS:

- A. **Paints and Primers:** Paints and primers used in non-specialized interior applications (i.e., for wallboard, plaster, wood, metal doors and frames, etc.) shall meet the VOC limitations of the Green Seal Paint Standard GS-11, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:

5. **Volatile Organic Compounds:**
- a. The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.

Interior Paints and Primers:

Non-flat: 150 g/l

Flat: 50 g/l

The calculation of VOC shall exclude water and tinting color added at the point of sale.



B. Anti-Corrosive and Anti-Rust Paints: Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates shall meet the VOC limitations of the Green Seal Paint Standard GC-03, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:

1. Volatile Organic Compounds:

a. The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.

Anti-Corrosive and Anti-Rust Paints: 250 g/l

The calculation of VOC shall exclude water and tinting color added at the point of sale.

1.11 VOC REQUIREMENTS FOR INTERIOR COATINGS:

A. Clear wood finishes, floor coatings, stains, sealers, and shellacs applied to the interior shall meet the VOC limitations defined in Rule 1113, "Architectural Coatings" of SCAQMD, of the State of California. The VOC limits defined by SCAQMD, based on 7/9/04 amendments, are as follows. VOC limits are defined in grams per liter, less water and less exempt compounds.

| | |
|--------------------------|-----|
| 1. Clear Wood Finishes: | |
| a. Varnish | 350 |
| b. Sanding Sealers | 350 |
| c. Lacquer | 550 |
| 2. Shellac: | |
| a. Clear | 730 |
| b. Pigmented | 550 |
| 3. Stains | 250 |
| 4. Floor Coatings | 100 |
| 5. Waterproofing Sealers | 250 |
| 6. Sanding Sealers | 275 |
| 7. Other Sealers | 200 |

The calculation of VOC shall exclude water and tinting color added at the point of sale.

1.12 SUBMITTALS:

A. Submit Material Safety Data Sheets, for all applicable products in accordance with Section 01 33 00, SUBMITTAL PROCEDURES. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) limits of products submitted. (If an MSDS does not include a product's VOC limits, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the MSDS to indicate the VOC limits).

B. Submit Environmental Building Materials Certification Form (EBMCF) as referenced in Section 01 81 13 SUSTAINABLE REQUIREMENTS FOR LEED BUILDINGS: For each field-applied adhesive, sealant, paint, and coating product, provide the VOC requirement, as provided in this Specification, for the relevant material category indicated on the documentation noted above.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.13



**SECTION 01 81 19
INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS**

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 19

PART I – GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 CONSTRUCTION IAQ MANAGEMENT GOALS FOR THE PROJECT:

- A. The City of New York has determined that this Project shall minimize the detrimental impacts on Indoor Air Quality (IAQ) resulting from construction activities. Factors that contaminate indoor air, such as dust entering HVAC systems and ductwork, improper storage of materials on-site, poor housekeeping, shall be minimized.

1.3 RELATED SECTIONS:

- A. All sections of the Specifications related to interior construction, MEP systems, and items affecting indoor air quality.
- B. Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS
- C. Section 01 81 13.13, VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS.
- D. Division 9 (of the Specifications): Finishes.

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
- C. Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products, including solvents in paints, coatings, adhesives and sealants, wood preservatives, composite wood binder, and foam insulations. Not all VOC's are harmful, but many of those contained within building products contribute to the formation of smog and may irritate building occupants by their smell and/or health impact.



- D. Materials that act as “sinks” for VOC contamination: Absorptive materials, typically dry and soft materials (such as textiles, carpeting, acoustical ceiling tiles and gypsum board) that readily absorb VOC's emitted by “source” materials and release them over a prolonged period of time.
- E. Materials that act as “sources” for VOC contamination: Products with high VOC contents that emit VOC's either rapidly during application and curing (typically “wet” products, such as paints, sealants, adhesives, caulks and sealers) or over a prolonged period (typically “dry” products such as flooring coverings with plasticizers and engineered wood with formaldehyde).

1.5 REFERENCES, RESOURCES:

- A. “IAQ Guidelines for Occupied Buildings Under Construction”, First Edition, November 1995, The Sheet Metal and Air Conditioner Contractors National Association (SMACNA). (703) 803-2980, www.smacna.org.
- B. ANS/ASHRAE 52.2-1999, “Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size”, www.ashrae.org

1.6 LEED BUILDING GENERAL REQUIREMENTS:

- A. Implement practices and procedures as necessary to meet the project's environmental performance goals as set forth in the specific requirements of this section. Specific project goals that may impact this area of work include: use of recycled-content materials; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in this Section, are implemented to the fullest extent. Substitutions or other changes to the work shall not be allowed if such changes compromise the stated LEED BUILDING Performance Criteria.

1.7 CONSTRUCTION IAQ MANAGEMENT PLAN :

- A. The Contractor shall prepare a Construction IAQ Management Plan in coordination with each subcontractor and submit the IAQ Management Plan to the Commissioner for approval in accordance with Section 01 33 00, SUBMITTAL PROCEDURE. The Construction IAQ Management Plan shall meet the following criteria:
 - 1. Construction activities shall be planned to meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors' Association (SMACNA) “IAQ Guidelines for Occupied Buildings under Construction”, First Edition, 1995.
 - 2. Absorptive materials shall be protected from moisture damage when stored on-site and after installation.
 - 3. If air handlers are to be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grill, as determined by ASHRAE 52.2-1999.
 - 4. Filtration media shall be replaced immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999 if the project is pursuing Indoor Air Quality Credit 5: Indoor Chemical Pollutant Source Control.
 - 5. A “Sequence of Finish Installation Plan” shall be developed, highlighting measures to reduce the absorption of VOCs by materials that act as “sinks”.
 - 6. Upon approval of the Plan by the Commissioner, it shall be implemented by the Contractor through the duration of the construction process, and documented in accordance with the Submittal Requirements of Sub-Section 1.8 herein.



- B. Further description of the Construction IAQ Management Plan requirements is as follows:
1. SMACNA Guidelines: Chapter 3 of the referenced "IAQ Guidelines for Occupied Buildings Under Construction", outline IAQ measures in five categories as listed below. The Construction IAQ Management Plan shall be organized in accordance with the SMACNA format, and shall address measures to be implemented in each of the five categories (including subsections). All subsections shall be listed in the Plan; items that are not applicable for this project should be listed as such.
 - a. HVAC Protection
 - 1) Protect air handling and distribution equipment and air supply and return ducting during construction.
 - 2) All ductwork arriving on site will be sealed with plastic sheeting and stored on pallets or dunnage until installed.
 - 3) Cover and protect all exposed air inlets and outlets, openings, grilles, ducts, plenums, etc. to prevent water, moisture, dust and other contaminant intrusion.
 - 4) Apply protection immediately after ducting.
 - 5) Protect ducting runs at the end of day's work.
 - 6) Inspect temporary filtration weekly and replace as required to maintain the proper ventilation rates in the building.
 - b. Source Control
 - 1) Protect stored on-site or installed absorptive or porous materials.
 - 2) Do not use wet or damaged porous materials in the building.
 - 3) Recover, isolate, and ventilate containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications.
 - 4) Exhaust fumes from idling vehicles and gasoline fueled tools through use of funnels or temporary piping.
 - 5) Containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications, shall be closed when not in use.
 - c. Pathway Interruption
 - 1) Depressurize work areas to contain dust and odors.
 - 2) Pressurize occupied spaces to prevent intrusion of dust and odors.
 - 3) Erect barriers to contain construction areas.
 - 4) Relocate pollutant sources.
 - 5) Temporarily seal the building and provide 100% outside air for ventilation.
 - d. Housekeeping
 - 1) Store materials on elevated platforms under cover, in a designated dry, clean location, prior to unpacking for installation.
 - 2) If materials are not stored in an enclosed location, cover tops and sides of material with waterproof sheeting, securely tied.
 - 3) Institute cleaning activities to remove contaminants from the building prior to occupancy. Clean all coils, air filters, and ductwork prior to performing testing, adjusting, and balancing of HVAC systems.
 - 4) Sweep the work area on a daily basis. Use an efficient and effective dust collecting method such as damp cloth, wet mop, or vacuum with particulate filters. Activities which produce high levels of dust shall be cleaned up immediately upon completion.
 - 5) Spills or excess applications of products containing solvents, or with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications, must be removed immediately.
 - 6) Dust all walls prior to application of finishes.
 - 7) Vacuum all stud tracks prior to application of insulation.
 - 8) Materials which become contaminated through direct exposure to moisture from



- precipitation, plumbing leaks, or condensation shall be replaced by the Contractor.
- e. Scheduling
- 1) Phase construction such that absorptive materials are installed only in areas that are weathertight.
 - 2) Schedule activities that utilize "sources" of VOC contamination to take place prior to installing high absorbent materials that will act as "sinks" for contaminants.
 - 3) Review of the appropriate components of the Construction IAQ Management Plan shall be a regular action topic at weekly site coordination meetings. Implementation of the Plan shall be documented in the meeting minutes.
2. Protection of Materials from Moisture Damage: As part of the "Housekeeping" section of the Construction IAQ Management Plan, measures to prevent installed materials or material stored on-site from moisture damage shall be described. This section should also describe measures to be taken if moisture damage does occur to absorptive materials during the course of construction.
3. Replacement of Filtration Media: Under the "HVAC Protection" section of the Construction IAQ Management Plan, a description of the filtration media in all ventilation equipment shall be provided. The description shall include replacement criteria for filtration media during construction, and confirmation of filtration media replacement for all equipment immediately prior to occupancy.
4. Sequence of Finish Installation for Materials: Where feasible, absorptive materials shall be installed after the installation of materials or finishes which have high short-term emissions of VOC's, formaldehyde, particulates, or other air-borne compounds. Absorptive materials include, but are not limited to: carpets; acoustical ceiling panels; fabric wall coverings; insulations (exposed to the airstream); upholstered furnishings; and other woven, fibrous or porous materials. Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paints, 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.
5. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase as follows:

OPTION 1 — Flush-Out

- After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total air volume of 14,000 cu.ft. of outdoor air per sq.ft. of floor area while maintaining an internal temperature of at least 60 degrees F and relative humidity no higher than 60%.

OR

- If occupancy is desired prior to completion of the flush-out, the space may be occupied following delivery of a minimum of 3,500 cu.ft. of outdoor air per sq.ft. of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm/sq.ft. of outside air or the design minimum outside air rate determined in EQ Prerequisite 1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14,000 cu.ft./sq.ft. of outside air has been delivered to the space.

OR



OPTION 2 — Air Testing

- Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the United States Environmental Protection Agency Compendium of Methods for the Determination of Air Pollutants in Indoor Air and as additionally detailed in the LEED-NC Reference Guide.
- Demonstrate that the contaminant maximum concentrations listed below are not exceeded.

| CONTAMINANT | MAXIMUM CONCENTRATION |
|--|---|
| Formaldehyde | 27 parts per billion |
| Particulates (PM10) | 50 micrograms per cubic meter |
| Total Volatile Organic Compounds (TVOC) | 500 micrograms per cubic meter |
| * 4-Phenylcyclohexene (4-PCH) | 6.5 micrograms per cubic meter |
| Carbon Monoxide (CO) | 9 part per million and no greater than 2 parts per million above outdoor levels |
| * This test is only required if carpets and fabrics with styrene butadiene rubber (SBR) latex backing material are installed as part of the base building systems. | |

- For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test.
- The air sample testing shall be conducted as follows:
 - a. All measurements shall be conducted prior to occupancy, but during normal occupied hours and with the building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
 - b. The building shall have all interior finishes installed, including but not limited to millwork, doors, paint, carpet and acoustic tiles. Non-fixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.
 - c. The number of sampling locations will vary depending upon the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq.ft., or for each contiguous floor area, whichever is larger, and include areas with the least ventilation and greatest presumed source strength.
 - d. Air samples shall be collected between 3 feet and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.
- 6. Implementation and Coordination: Implement the Construction IAQ Management Plan, and coordinate the Plan with all affected trades. Designate one individual as the Construction IAQ Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis, and for assembling the required LEED documentation. Include provisions in the Construction IAQ Management Plan for addressing conditions in the field that do not adhere to the Plan, including provisions to implement a stop work order, or to rectify non-compliant conditions.



- a. Distribution: The Contractor shall distribute copies of the Construction IAQ Management Plan in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.
- b. Instruction: The Contractor shall provide on-site instruction of appropriate site management to all Contractor's Subcontractors.
- c. Monitoring: The Construction IAQ Representative shall monitor the implementation of the Construction IAQ Management Plan.

1.8 SUBMITTALS:

Submit the following LEED-required records and documents in accordance with Section 01 33 00, SUBMITTAL PROCEDURES and Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS.

- A. A copy of the Construction IAQ Management Plan as defined in Sub-Section 1.07 herein.
- B. Product cut-sheets for all filtration media used during construction and installed immediately prior to occupancy, with MERV values highlighted. Cut sheets shall be submitted with the Contractor's or Subcontractor's 'approved' stamp as confirmation that the products are the products installed on the project.
- C. Provide the Commissioner with a minimum of 18 photographs as required under the provision for Special Photographs, in accordance with Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION, comprised of at least six photographs taken on three different occasions during construction. The photographs shall document the implementation of the Construction IAQ Management Plan throughout the course of the project construction. Examples include photographs of ductwork sealing and protection, temporary ventilation measures, and conditions of on-site materials storage (to prevent moisture damage). Photographs shall include integral date stamping, and shall be submitted with brief descriptions of the Construction IAQ Management Plan measure documented, or be referenced to project meeting minutes or similar project documents which reference to the Construction IAQ Management Plan measure documented.
- D. A copy of the project's TAQ Testing report if applicable.

1.9 QUALITY ASSURANCE:

- A. The Contractor shall be responsible for preparing and implementing the Construction IAQ Management Plan and shall coordinate and incorporate the work of its subcontractors in the IAQ Management Plan.
- B. Responsibility of Subcontractors: Subcontractors for this project shall be responsible to cooperate with the Contractor in the preparation and implementation of the Construction IAQ Management Plan.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 19



SECTION 01 91 13
GENERAL COMMISSIONING REQUIREMENTS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 13

PART I - GENERAL

1.1 RELATED DOCUMENTS:

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. OPR and BoD documentation are included by reference for information only.
- C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

1.2 SUMMARY:

- A. This Section includes general requirements that apply to implementation of Commissioning without regard to systems, subsystems, and equipment being commissioned.
- B. This Section includes:
 - 1. Definitions
 - 2. Commissioning Team
 - 3. City's Responsibilities
 - 4. Each Contractor's Responsibilities
 - 5. Commissioning Authority's/Agent's (CxA) Responsibilities
 - 6. Commissioning Documentation
 - 7. Submittals
 - 8. Coordination

1.3 RELATED SECTIONS: Include without limitation the following:

- A. "HVAC Commissioning Requirements" indicated in other sections of the project specifications for specific requirements for commissioning HVAC systems.
- B. This project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED procedures, and specific commissioning requirements of the Project Specifications, whichever is more stringent. The Contractor shall cooperate with the CxA and provide whatever assistance is required.
- C. Related Sections include without limitation the following:
 - 1. Section 01 10 00 SUMMARY
 - 2. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
 - 3. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
 - 4. Section 01 78 39 CONTRACT RECORD DOCUMENTS
 - 5. Section 01 79 00 DEMONSTRATION AND TRAINING
 - 6. Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS

1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.



- B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
- C. Commissioner: The Commissioner of the Department of Design and Construction of the City of New York, his/her successors, or duly authorized representative(s).
- D. BoD: Basis of Design: A document, prepared by the Consultant Architect/Engineer, that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- E. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.
- F. CxA: Commissioning Agent (Aka Commissioning Authority) under separate contract with the City of New York to provide Commissioning Services for this project.
- G. OPR: Owner's (City of New York) Project Requirements: A document, prepared by the Consulting Architect/Engineer that details the functional requirements of a project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
- H. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.
- I. TAB: Testing, Adjusting, and Balancing.

1.5 COMMISSIONING TEAM:

- A. Members Appointed by the Contractor and its Subcontractors: Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of the Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.
- B. Members Appointed by the City:
 - 1. Commissioning Authority/Agent (CxA): The designated person, company, or entity under separate contract with the City that plans, schedules, and coordinates the commissioning team to implement the commissioning process.
 - 2. Representatives of the facility user and operation and maintenance personnel.
 - 3. Consultant Architect/Engineer and other concerned entities.

1.6 CITY'S RESPONSIBILITIES:

- A. Provide the OPR documentation to the Commissioning Agent (CxA) for use in developing the commissioning plan; systems manual; operation and maintenance training plan; and testing plans and checklists.
- B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.



- C. Provide the BoD documents, prepared by the Consulting Architect/Engineer and approved by the Commissioner, to the Commissioning Agent (CxA) for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

1.7 CONTRACTOR'S RESPONSIBILITIES:

- A. The Contractor shall provide utility services required for the commissioning process.
- B. As a member of the Commissioning Team, the Contractor and subcontractor(s) shall assign representatives with expertise and authority to act on behalf of the Contractor and its subcontractor(s) and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
 1. Participate in scheduled construction-phase coordination and commissioning team meetings.
 2. Integrate and coordinate commissioning process activities with the construction schedule.
 3. Review and accept commissioning process test procedures provided by the CxA.
 4. Review and accept construction checklists provided by the CxA.
 5. Perform testing required in the Commissioning Schedule as per the Commissioning Process test procedures provided by the CxA.
 6. Complete installation checklists as Work is completed and return to CxA through the Resident Engineer.
 7. Cooperate with the CxA for resolution of issues recorded in the Issues Log.
 8. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
 9. Submit As-Built documents, operation and maintenance manuals for systems and subsystems, and equipment in accordance with Section 01 78 39, CONTRACT RECORD DOCUMENTS.
 10. Provide orientation sessions for operation and maintenance personnel (sessions will be video recorded by the CxA) in accordance with Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

1.8 COMMISSIONING AGENT'S (CxA) RESPONSIBILITIES:

- A. Organize and lead the commissioning team.
- B. Prepare a construction-phase commissioning plan. Collaborate through the Resident Engineer with each Contractor and with subcontractors to develop test and inspection procedures. Include design changes and coordinate commissioning activities with the overall Project schedule. Identify commissioning team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task.
- C. Review and comment in accordance with Section 01 33 00, SUBMITTAL PROCEDURES, on submittals from the Contractor for compliance with the OPR, BoD, Contract Documents, and construction-phase commissioning plan. Review and comment on performance expectations of systems and equipment and interface between systems relating to the OPR and BoD.
- D. Coordinate with the Resident Engineer to convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss progress of the commissioning processes. Responsibilities include arranging for facilities, preparing agenda and attendance lists, and notifying participants. The Commissioning Agent CxA will prepare and distribute minutes to commissioning team members and attendees within three workdays of the commissioning meeting.
- E. At the beginning of the construction phase, coordinate with the Resident Engineer's kick-off meeting schedule to conduct an initial construction-phase coordination meeting for the purpose of reviewing the commissioning activities and establishing tentative schedules for operation and maintenance submittals, operation and maintenance training sessions, TAB Work, and Project completion.



- F. Observe and inspect construction. Report progress and deficiencies to the Commissioner. In addition to compliance with the OPR, BoD, and Contract Documents, inspect systems and equipment installation for adequate accessibility required for component maintenance replacement and repair.
- G. Prepare Project-specific test and inspection procedures and checklists.
- H. Coordinate with the Resident Engineer to schedule, direct, witness, and document tests, inspections, and systems startup.
- I. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning report.
- J. Certify date of acceptance and startup for each item of equipment for start of warranty periods.
- K. Review and comment on operation and maintenance documentation and systems manual outline for compliance with the OPR, BoD, and Contract Documents. Operation and maintenance documentation requirements are specified in other sections of the project specifications and described in Section 01 78 39, CONTRACT RECORD DOCUMENTS.
- L. Record and edit demonstration and orientation sessions on DVD.
- M. Prepare commissioning reports.
- N. Assemble the final commissioning documentation, including the commissioning report and Systems Manual.

1.9 COMMISSIONING DOCUMENTATION:

The Contractor shall assist the Commissioning Agent (CxA) in the development and compiling of the following Commissioning Documentation:

- A. Index of Commissioning Documents: The Commissioning Agent (CxA) will prepare an index including the storage location of each document.
- B. OPR: A written document prepared by the Commissioning Agent (CxA) that details the functional requirements of the Project and expectations of how it will be used and operated. This document includes the Project and design goals, measurable performance criteria, budgets, schedules, success criteria, and supporting information.
- C. BoD Document: A document prepared by the Consulting Architect/Engineer that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that explain the designed systems.
- D. Commissioning Plan: A document prepared by the Commissioning Agent (CxA) that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process.
- E. Test Checklists: The Commissioning Agent (CxA) will develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. The CxA will prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Space will be provided for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in other sections of the project specifications.
- F. Inspection Checklists will be signed by the Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing.
- G. Test and Inspection Reports: The Commissioning Agent (CxA) will record test data, observations, and measurements on test checklists. Photographs, forms, and other means appropriate for the application will be included with data. CxA shall compile test and inspection reports and test and inspection certificates and include them in systems manual and commissioning report.



- H. Corrective Action Documents: The Commissioning Agent (CxA) will document corrective action taken for systems and equipment that fail tests and include required modifications to systems and equipment and revisions to test procedures, if any. The Contractor shall retest systems and equipment requiring corrective action. The CxA will document retest results.
- I. Issues Log: The Commissioning Agent (CxA) will prepare and maintain an issues log that describes design, installation, and performance issues that are at variance with the OPR, BoD, and Contract Documents. The log will identify and track issues as they are encountered, documenting the status of unresolved and resolved issues.
 - 1. Commissioning Report: The Commissioning Agent (CxA) will document results of the commissioning process including unresolved issues and performance of systems, subsystems, and equipment. The commissioning report will indicate whether systems, subsystems, and equipment have been completed and are performing according to the OPR, BoD, and Contract Documents.
- J. Systems Manual: The Commissioning Agent (CxA) will gather required information and compile systems manual as specified in other sections of the project specifications and described in Section 01 78 39, CONTRACT RECORD DOCUMENTS..

1.10 SUBMITTALS:

- A. Commissioning Plan Pre-final Submittal: The Commissioning Agent (CxA) will submit six (6) copies of the pre-final commissioning plan to the Commissioner for review and distribution.
- B. Commissioning Plan Final Submittal: The Commissioning Agent (CxA) will submit six (6) hard copies and electronically formatted information of the final commissioning plan to the Commissioner. The final submittal will address previous review comments.
- C. Test and Inspection Reports: CxA will submit test and inspection reports.
- D. Corrective Action Documents: CxA will submit corrective action documents.

1.11 COORDINATION:

- A. Coordinating Meetings: The Commissioning Agent (CxA) will coordinate with the Resident Engineer's regularly scheduled construction progress meetings to conduct coordination meetings of the commissioning team to review progress on the commissioning plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities.
- B. Pre-testing Meetings: The Commissioning Agent (CxA) will coordinate with the Resident Engineer to conduct pretest meetings of the commissioning team to review startup reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.
- C. Testing Coordination: The Commissioning Agent (CxA) will coordinate with the Resident Engineer the sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Coordinate schedule times with the Resident Engineer for tests, inspections, obtaining samples, and similar activities.
- D. Manufacturers' Field Services: The Commissioning Agent (CxA) will coordinate services of manufacturers' field services.

PART II – PRODUCTS (Not Used)



PART III – EXECUTION

3.1 OPERATION & MAINTENANCE MANUALS

A. General

1. The CxA shall review the Operation & Maintenance manuals provided by the Contractor or subcontractors for completeness of the document. The review process shall verify that Operation & Maintenance instructions meet specifications and are included for all commissioned equipment furnished by the Contractor.
2. Published literature shall be specifically oriented to the provided equipment, indicating required operation and maintenance procedures, parts lists, assembly / disassembly diagrams and related information.
3. The Contractor shall incorporate the standard technical literature into system specific formats for this facility as designed and as actually installed. The resulting Operation & Maintenance information shall be system specific, concise, to the point and tailored specifically to this facility. The CxA shall review these documents as necessary for final corrections by the Contractor.

- B. The Operation & Maintenance Manual review and coordination efforts shall be completed prior to Owner orientation sessions, as these documents are to be utilized in the training sessions.

C. System Operations Manual

1. The CxA shall prepare and deliver these documents with inputs from other agencies. The contractors will confirm the proper documents are onsite and readily available. Typically, the manual includes the following:
 - a. Commissioned systems single line diagrams (Mechanical, Electrical, Plumbing, and Building Management System (BMS) subcontractors).
 - b. As built sequences of operations, control drawings and original set points (Design Consultant and BMS subcontractor)
 - c. Operating instructions for integrated building systems (mechanical and BMS subcontractors).
 - d. Recommended schedule of maintenance requirements and frequency (subcontractors).
 - e. Recommended schedule for calibrating sensors and actuators (BMS subcontractor)

3.2 DEMONSTRATION AND INSTRUCTION

- A. The Contractor shall schedule and coordinate instruction sessions for the facility's staff for each commissioned system. Demonstrations shall be held per Contract Documents, along with the appropriate schematics, handouts and visual / audio training aids onsite with equipment.
- B. The equipment vendors shall provide instruction on the specifics of each major equipment item including philosophy, troubleshooting and repair techniques.
- C. For additional prescription pertinent to instruction, refer to other specific divisions for demonstration and instruction requirements.

3.3 WARRANTY REVIEW / SEASONAL TESTING

- A. The CxA will return upon the start of the new season (cooling or heating) after project completion to conduct performance tests that could not be performed due to ambient conditions. The seasonal testing will only be performed if unsuitable loads / conditions were unavailable during the performance testing stages (in other words; the requirement for testing is warranted).
- B. If agreed upon by facility, Seasonal Testing can also be used for the Warranty Review. During which the CxA will interview the occupants, maintenance staff, review the operation of the building, provide recommendations for installation and operational problems and document warranty and operational issues in the issues database.



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date - June 01, 2013
Revised - January 15, 2015

3.4 RECORD DRAWINGS

- A. The CxA shall review the as built contract documents to verify incorporation of both design changes and as built construction details. Discrepancies noted shall be corrected by the appropriate party.

END OF SECTION 01 91 13



NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date - June 01, 2013
Revised - January 15, 2015

NO TEXT

GENERAL COMMISSIONING REQUIREMENT
01 91 13 - 8



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



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FMS ID: LBKA05RUG



Department of
Design and
Construction

**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC 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 and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

**Renovation of the Rugby Branch
Library Re-Bid**

LOCATION: 1000 Utica Avenue
BOROUGH: Brooklyn 11203
CITY OF NEW YORK

Ashnu International, Inc
Contractor

Dated June 27, 2016

Approved as to Form
Certified as to Legal Authority

[Signature]
Acting Corporation Counsel

JSK 1/27/16

Dated January 27, 2016

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____, 20____





Department of
Design and
Construction

PROJECT ID:

LBKA05RUG

**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
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VOLUME 3 OF 3

**ADDENDUM TO THE GENERAL
CONDITIONS**

SPECIFICATIONS

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

**Renovation of the Rugby Branch
Library Re-Bid**

LOCATION:
BOROUGH:
CITY OF NEW YORK

1000 Utica Avenue
Brooklyn 11203

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

Brooklyn Public Library

Locascio Architect



Date: November 23, 2015

6-085





NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

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

ADDENDUM TO THE GENERAL CONDITIONS
FOR SINGLE CONTRACT PROJECTS

The General Conditions are hereby amended in accordance
with the terms and conditions set forth in this Addendum.

I. PROJECT DESCRIPTION

FMS #: **LBKA05RUG**

PROJECT NAME: *Renovation of the Rugby Branch Library*

PROJECT DESCRIPTION: This Project consists of *replacement of all windows, street front façade renovation, replacement of interior finishes and plumbing fixtures, electrical/data and fire alarm work, targeted interior and exterior light fixture replacement/additions, replacement of rooftop/mechanical room HVAC equipment and new shelving/furnishing.*

PROJECT LOCATION: **1000 Utica Avenue**
BOROUGH: **Brooklyn**
CITY OF NEW YORK
ZIP CODE: **11203**
COMMUNITY BOARD #: **17**

LANDMARK STATUS:

DESIGNATED LANDMARK STRUCTURE OR SITE: **NO**

If this is a Designated Landmark Structure or Site, Section 01 3591, Historic Treatment Procedures applies to this project.

LANDMARK QUALITY STRUCTURE: **NO**

If this is a Landmark Quality Structure, Section 01 3591, Historic Treatment Procedures applies to this project.

II. LEED GREEN BUILDING REQUIREMENTS

Not Used

III. COMMISSIONING REQUIREMENTS

Not Used

IV. PROJECT MANAGEMENT

- DDC shall publicly bid and enter into all contracts for the Project. DDC shall manage the Project using its own personnel.
- DDC shall publicly bid and enter into all contracts 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 entitled "The Resident Engineer".

V. 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 (General Conditions, Drawings and Specifications), 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.

VI. 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.

VII. APPLICABILITY OF SECTIONS/SUB-SECTIONS AND AMENDED SUB-SECTIONS

The Contractor is advised that various Sections/Sub-Sections in the General Conditions may not apply to this Project or may apply as amended. Such Sections/Sub-Sections advise the Contractor to "Refer to the Addendum for the applicability of this Section/Sub-Section." Such Sections/Sub-Sections are set forth below. A check mark indicates whether the Section/Sub-Section (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 Section/Sub-Section, as set forth in the General Conditions, applies to the Project. Amended Sections/Sub-Sections, if any, are set forth following this list of Sections.

| <u>Section</u> | <u>Sub-Section</u> | <u>Sub-Section</u> | <u>Applies</u> | <u>Does not Apply</u> | <u>Applies as Amended</u> |
|----------------|--------------------|--|----------------|-----------------------|---------------------------|
| 01 1000 | 1.4 (B) | Scope and Intent / LEED | | X | |
| | 1.4(C) | Scope and Intent / Commissioning | | X | |
| 01 3233 | | Photographic Documentation | X | | |
| 01 3300 | 1.7 (A-D) | LEED Submittals | | X | |
| 01 3503 | | General Mechanical Requirements | X | | |
| 01 3506 | 3.2 (A-B) | Electrical Conduit System Including Boxes (Pull, Junction and Outlet) | X | | |
| | 3.3 (A-E) | Electrical Wiring Devices | X | | |
| | 3.4 (A-I) | Electrical Conductors and Terminations | X | | |
| | 3.5 (A-B) | Circuit Protective Devices | X | | |
| | 3.6 (A-J) | Distribution Centers | X | | |
| | 3.7 (A-I) | Motors | X | | |
| | 3.8 (A-I) | Motor Control Equipment | X | | |
| 01 3591 | | Historic Treatment Procedures | | X | |
| 01 5000 | 3.2 (A) | Temporary Water Facilities / Temporary Water | X | | |
| | 3.2 (B) | Temporary Water Facilities / Temporary Water – Work in Existing Facilities | | X | |
| | 3.3 (B) | Temporary Sanitary Facilities / Self-Contained Toilet Units | X | | |
| | 3.3 (C) | Temporary Sanitary Facilities / Existing Toilets | | X | |
| | 3.4 (B) 1 | Temporary Power, Lighting, and Site Lighting / Connection to Utility Lines | X | | |

| <u>Section</u> | <u>Sub-Section</u> | <u>Sub-Section</u> | Applies | Does not Apply | Applies as Amended |
|----------------|--------------------|--|---------|----------------|--------------------|
| 01 5000 | 3.4 (B) 2 | Temporary Power, Lighting, and Site Lighting / Connection to Existing Electrical Power Service | X | | |
| | 3.4 (B) 3 | Temporary Power, Lighting, and Site Lighting / Electrical Generator Power Service | | X | |
| | 3.4 (D) | Temporary Power, Lighting, and Site Lighting / Temporary Lighting | | X | |
| | 3.4 (E) | Temporary Power, Lighting, and Site Lighting / Site Security Lighting (for New Construction Only) | | X | |
| | 3.5 (A-J) | Temporary Heat | X | | |
| | 3.8 (A) | DDC Field Office / Office Space in Existing Building | X | | |
| | 3.8 (B) | DDC Field Office / DDC Field Office Trailer | | X | |
| | 3.8 (B-3a) | DDC Field Office / DDC Managed Field Office Trailer | | X | |
| | 3.8 (B-3b) | DDC Field Office / CM Managed Field Office Trailer | | X | |
| | 3.8 (D) | DDC Field Office / Additional Equipment for the DDC Field Office | X | | |
| | 3.13(A-D) | Work Fence Enclosure | X | | |
| | 3.17(B) | Project Rendering | X | | |
| | 3.18 (A-C) | Security Guards / Fire Guards on Site | | X | |
| 01 5411 | 3.1 (A-J) | Temporary Use, Operation and Maintenance of Elevators During Construction for New Buildings Up To and Including 15 Stories | | X | |
| | 3.2 (A-M) | Temporary Use, Operation and Maintenance of Elevators During Construction for New Buildings Over 15 Stories | | X | |
| | 3.3 (A-E) | Temporary Use, Operation and Maintenance of Elevators During Construction for Existing Buildings | | X | |
| 01 7300 | 3.3 (A-I) | Surveys | X | | |
| | 3.4 (A-B) | Borings | | X | |
| | 3.12 (A-D) | Sleeves and Hangers | | X | |
| | 3.13 (A) | Sleeve and Penetration Drawings | | X | |
| | 3.15 (A) | Location of Partitions | X | | |
| 01 7419 | 1.5 (C) | Waste Management Performance Requirements / LEED Certification | | X | |
| 01 7900 | | Demonstration and Owner's Pre-Acceptance Orientation | X | | |
| 01 8113 | | Sustainable Design Requirements for LEED Buildings | | X | |
| 01 8113.13 | | VOC Limits for Adhesives, Sealants, Paints and Coatings for LEED Buildings | | X | |
| 01 8119 | | Indoor Air Quality Requirements for LEED Buildings | | X | |
| 01 9113 | | General Commissioning Requirements | | X | |

VIII. SPECIAL EXPERIENCE REQUIREMENTS FOR THE PROJECT

- (1) **GENERAL:** Special Experience Requirements for the Project are set forth below. Such Special Experience Requirements may apply to either or both of the following entities: (a) the contractor or subcontractor that will perform specific areas of work, and/or (b) the manufacturer that will provide specific material or equipment.
- (2) **REVISION OF SPECIFICATIONS AND DRAWINGS:** In the event the Specifications and/or the Contract Drawings contain any Special Experience Requirements that are not set forth below, such Special Experience Requirements are deemed deleted, except as otherwise expressly provided in Section VIII 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 Special 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 any specific area of work with its own forces, it must demonstrate compliance with the Special Experience Requirements. If the contractor intends to subcontract any specific area 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.

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, based on architectural style, construction method and materials and age of building for this particular project. One such prior project of the three must have involved a landmarked building, as officially designated by the City, State or federal government.

General Construction:

- Section 16800 – Electronic Security System

- (4) **SPECIAL EXPERIENCE REQUIREMENTS FOR MANUFACTURERS:** The special experience requirements set forth below apply to the manufacturer that will supply or fabricate specific material or equipment. Compliance with such experience requirements will be evaluated after an award of contract. Within two (2) weeks of award, the contractor will be required to submit the qualifications of the proposed manufacturer(s). 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 #2:** The manufacturer providing the material or equipment specified in this section must, for the past five (5) years, have been regularly engaged in the manufacture of material or equipment similar in type to that required for this Project. Such similar material or equipment provided by the manufacturer must have been in satisfactory service for not less than five (5) years. This Special Experience Requirement applies to the manufacturer that will provide material or equipment specified in the section(s) set forth below.

General Construction:

- Section 16800 – Electronic Security System

IX. 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)
PART I - 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 #1 |
|-------------------------|---------------------------------------|--|--|
| Information For Bidders | Bid Security | | See Attachment 1 – Bid Information in the Bid Booklet |
| Information For Bidders | Performance and Payment Bonds | | See Attachment 1- Bid Information in the Bid Booklet |
| Article 14 Contract | Time of Completion | Consecutive Calendar Days | 540 ccds |
| Article 15 Contract | Liquidated Damages | For each consecutive calendar day over completion 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 \$1,000,000 or less 5%
If 100% bonds are not required, and Contract Price is more than \$1,000,000 10% |
| Article 24 Contract | Deposit Guarantee | Percent of Contract Price | 1% |
| Article 24 Contract | Period of Guarantee | | See Schedule B of the Addendum to the General Conditions |
| Article 74 Contract | Statement of Work | | See Contract Article 74 |
| Article 75 Contract | Compensation to be Paid to Contractor | | See Contract Article 75 |
| Article 78 Contract | MWBE Program | | See MWBE Utilization Plan in the Bid Booklet |

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Note: All certificate(s) of insurance submitted pursuant to Contract Article 22.3. 3 must be accompanied by a Certification by Broker consistent with Part III below and include the following information:

- For each insurance policy, the name and NAIC number of issuing company, number of policy, and effective dates;
- Policy limits consistent with the requirements listed below;
- Additional insureds or loss payees consistent with the requirements listed below; and
- The number assigned to the Contract by the City (in the "Description of Operations" field).

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 |
|--|---|
| <p>■ Commercial General Liability Art. 22.1.1</p> | <p>The minimum limits shall be \$1,000,000.00 per occurrence and \$2,000,000.00 per project aggregate applicable to this Contract.</p> <p>Additional Insureds:</p> <p>1. City of New York, including its officials and employees, with coverage at least as broad as ISO Forms CG 20 10 and CG 20 37, and</p> <p>2. All person(s) or organization(s), if any, that Article 22.1.1(b) of the Contract requires to be named as Additional Insured(s), with coverage at least as broad as ISO Form CG 20 26. The Additional Insured endorsement shall either specify the entity's name, if known, or the entity's title (e.g., Project Manager).</p> <p>3. _____</p> |
| <p>■ Workers' Compensation Art. 22.1.2</p> <p>■ Disability Benefits Insurance Art. 22.1.2</p> <p>■ Employers' Liability Art. 22.1.2</p> <p><input type="checkbox"/> Jones Act Art. 22.1.3</p> <p><input type="checkbox"/> U.S. Longshoremen's and Harbor Workers Compensation Act Art. 22.1.3</p> | <p>Workers' Compensation, Employers' Liability, and Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction.</p> <p>Note: The following forms are acceptable: (1) New York State Workers' Compensation Board Form No. C-105.2, (2) State Insurance Fund Form No. U-26.3, (3) New York State Workers' Compensation Board Form No. DB-120.1 and (3) Request for WC/DB Exemption Form No. CE-200. The City will not accept an ACORD form as proof of Workers' Compensation or Disability Insurance.</p> <p>Jones Act and U.S. Longshoremen's and Harbor Workers' Compensation Act: Statutory per U.S. law.</p> |

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, 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 |
|--|---|
| <input checked="" type="checkbox"/> Builders' Risk Art. 22.1.4 | <p>100 % of total value of Work</p> <p>Contractor the Named Insured; the City both an Additional Insured and one of the loss payees as its interests may appear.</p> <p>If the Work does not involve construction of a new building or gut renovation work, the Contractor may provide an installation floater in lieu of Builders Risk insurance.</p> <p>Note: Builders Risk Insurance may terminate upon Substantial Completion of the Work in its entirety.</p> |
| <input checked="" type="checkbox"/> Commercial Auto Liability Art. 22.1.5 | <p>\$1,000,000.00 per accident combined single limit</p> <p>If vehicles are used for transporting hazardous materials, the Contractor shall provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90</p> |
| <input type="checkbox"/> Contractor's Pollution Liability Art. 22.1.6 | <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. 22.1.7(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 II. Types of Insurance, 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 |
|---|--|
| <input type="checkbox"/> Hull and Machinery Insurance Art. 22.1.7(b) | \$ _____ 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. 22.1.7(c) | \$ _____ each occurrence

Additional Insureds:
1. City of New York, including its officials and employees, and
2. _____
3. _____ |
| [OTHER] Art. 22.1.8

<input type="checkbox"/> Ship Repairers Legal Liability | \$ _____ each occurrence |
| [OTHER] Art. 22.1.8

<input type="checkbox"/> Collision Liability/Towers Liability | \$ _____ per occurrence

\$ _____ aggregate

Additional Insureds:
1. City of New York, including its officials and employees, and
2. _____
3. _____ |
| [OTHER] Art. 22.1.8

<input type="checkbox"/> Railroad Protective Liability | \$ _____ per occurrence

\$ _____ aggregate

Additional Insureds:
1. City of New York, including its officials and employees, and
2. _____
3. _____ |

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, 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.

| | |
|---|---|
| <p>[OTHER] Art. 22.1.8</p> <p>■ Asbestos Liability _____</p> | <p>Only required of the Contractor or Subcontractor performing any required asbestos removal.</p> <p>\$1,000,000 each occurrence,
 \$2,000,000 aggregate (Combined Single Limit); only required of the Contractor or Subcontractor performing any required asbestos removal.</p> <p>Additional Insureds:
 1. City of New York, including its officials and employees, and
 2. Brooklyn Public Library
 3. _____</p> |
| <p>[OTHER] Art. 22.1.8</p> <p>□ Boiler Insurance _____</p> | <p>\$200,000</p> |
| <p>[OTHER] Art. 22.1.8</p> <p>■ Professional Liability</p> <p>In the event any section of the Specifications requires the Contractor to engage a Professional Engineer to provide design and/or engineering services, the Engineer engaged by the Contractor, as well as any sub consultant(s) performing professional services, shall provide Professional Liability Insurance.</p> | <p>\$1,000,000 per occurrence</p> <p>The Contractor's Professional Engineer shall maintain and submit evidence of Professional Liability Insurance in the minimum amount of \$1,000,000 per claim. The policy or policies shall include an endorsement to cover the liability assumed by the Contractor under this Agreement arising out of the negligent performance of professional services or caused by an error, omission or negligent act of the Contractor's Professional Engineer or anyone employed by the Contractor's Professional Engineer.</p> <p>Claims-made policies will be accepted for Professional Liability Insurance. All such policies shall have an extended reporting period option or automatic coverage of not less than two (2) years. If available as an option, the Contractor's Professional Engineer shall purchase extended reporting period coverage effective on cancellation or termination of such insurance unless a new policy is secured with a retroactive date, including at least the last policy year.</p> |

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART III. Certificates of Insurance

All certificates of insurance (except certificates of insurance solely evidencing Workers' Compensation Insurance, Employer's Liability Insurance, and/or Disability Benefits Insurance) must be accompanied by one of the following:

- (1) the Certification by Insurance Broker or Agent on the following page setting forth the required information and signatures;

-- OR --

- (2) copies of all policies as certified by an authorized representative of the issuing insurance carrier that are referenced in such certificate of insurance. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART IV. Address of Commissioner

Wherever reference is made in Article 7 or 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 below or, in the absence of such address, to the **Commissioner's** address as provided elsewhere in this **Contract**.

ACCO's Office, Insurance Unit

30-30 Thomson Avenue, 4th Floor

Long Island City, New York 11101

SCHEDULE B

Guarantees and Warranties

(Reference: Section 01 7839, Article 2.7 of the DDC Standard 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 |
|----------------------|------------------------------------|-----------------|
| 02900 | Plants | 2 years |
| 03542 | Self Levelling Underlayment | 5/10 years |
| 07130 | Sheet Membrane Waterproofing | 10 years |
| 07420 | Zinc Panels | 5 years |
| 07500 | Fluid Applied Membrane Roofing Sys | 20 years |
| 07720 | Roof Hatch | 5 years |
| 08100 | Steel Doors/Frames | 1 year |
| 08214 | Doors[Special Fabrication] | 1 year |
| 08520 | Aluminum Windows | 10 years |
| 08800 | Glass Glazing | 10 years |
| 08910 | Aluminum Assemblies | 10 years |
| 08955 | Channel Glazing | 10 years |
| 09685 | Carpet Tile | 5 years |
| 10522 | Fire Extinguishers | 6 years |
| 15010 | General Mech, Plumb and FP | 12 months |
| 15900 / 15990 | HVAC Equipment | 12 months |

| Specification Number | Material or Equipment | Warranty Period |
|----------------------|-------------------------|-----------------|
| 15121 | Piping Exp Compensation | 60 months |
| 16010 | General Electrical | 12 months |
| 16220 | Fire Alarm | 12 months |
| 16750 | Telecom Cabling System | 12 months |
| 16751 | Telecom Pathways System | 12 months |
| 16800 | Security System | 12 months |

(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.
- (e) Unless indicated otherwise Warranties are to take effect on the date of Substantial Completion.

SCHEDULE C

Contract Drawings

(Reference: Section 01 1000, Article 1.5 (A) of the DDC Standard General Conditions)

The Schedule set forth below lists all Contract Drawings for the Project.

| | |
|-----------|--|
| A-001.00 | TITLE SHEET |
| A-002.00 | SWING SPACE PREPARATION AND GARDEN REMOVALS PLAN |
| A-003.00 | GARDEN RESTORATION PLAN AND DETAILS |
| 1 of 1 | TOPOGRAPHICAL AND PROPERTY LINE MAP |
| H-001 | ASBESTOS ABATEMENT GENERAL NOTES |
| H-002 | ASBESTOS ABATEMENT FIRST FLOOR PLAN |
| H-003 | ASBESTOS ABATEMENT EXTERIOR FACADE PLAN |
| H-004 | ASBESTOS ABATEMENT ROOF PLAN |
| A-100.00 | FIRST FLOOR DEMOLITION PLAN |
| A-101.00 | FIRST FLOOR CONSTRUCTION PLAN |
| A-102.00 | FIRST FLOOR FURNITURE PLAN |
| A-103.00 | FIRST FLOOR REFLECTED CEILING PLAN |
| A-104.00 | ROOF PLAN |
| A-105.00 | ROOF DETAILS AND PATRON MEETING ROOM DETAILS |
| A-200.00 | EXTERIOR ELEVATIONS |
| A-201.00 | CANOPY DETAILS |
| A-202.00 | ROOFTOP HVAC ENCLOSURE |
| A-203.00 | VESTIBULE SECTION/PLANS |
| A-204.00 | SECTIONS/DETAILS |
| A-300.00 | INTERIOR ELEVATIONS |
| A-301.00 | COMMUNITY ROOM CREDENZA ELEVATIONS AND DETAILS |
| A-302.00 | BOOK DROP PLANS, ELEVATIONS AND DETAILS |
| A-303.00 | WORKROOM AND EXTERIOR BOOKDROP DETAILS + ELEVATION |
| A-304.00 | KITCHEN AND STAFF ROOM CABINETRY |
| A-305.00 | CUSTOMER SERVICE DESK PLANS/ELEVATIONS/DETAILS |
| A-400.00 | FINISH SCHEDULE/DETAILS |
| A-401.00 | WINDOW SCHEDULE/DETAILS |
| A-402.00 | DOOR SCHEDULE/DETAILS |
| S-101.00 | STOREFRONT AND CANOPY PLANS |
| S-102.00 | NEW ROOF ENCLOSURE PLAN |
| S-201.00 | STRUCTURAL NOTES; TYPICAL DETAILS AND SECTIONS |
| S-202.00 | ROOF ENCLOSURE SECTIONS & DETAILS |
| M-100.00 | H.V.A.C. TITLE SHEET |
| M-201D.00 | H.V.A.C. GROUND FLOOR DUCTWORK AND PIPING DEMOLITION PLAN |
| M-201.00 | H.V.A.C. GROUND FLOOR DUCTWORK AND PIPING PLAN |
| M-202.00 | H.V.A.C. CELLAR PLAN, ROOF PLAN & AIR FLOW DIAGRAMS |
| M-300.00 | H.V.A.C. SCHEDULES SHEET 1 OF 2 |
| M-301.00 | H.V.A.C. SCHEDULES SHEET 2 OF 2 |
| M-400.00 | H.V.A.C. DETAILS SHEET 1 OF 2 |
| M-401.00 | H.V.A.C. DETAILS SHEET 2 OF 2 |
| E-100.00 | ELECTRICAL TITLE SHEET |
| E-300.00 | ELECTRICAL GROUND FLOOR POWER PLAN |
| E-400.00 | ELECTRICAL GROUND FLOOR & ROOF LIGHTING PLANS |
| E-500.00 | ELECTRICAL POWER RISER DIAGRAM AND PANEL SCHEDULES |
| E-700.00 | ELECTRICAL DETAILS |
| FA-100.00 | CELLAR & GROUND FLOOR FIRE ALARM PLANS, RISER DIAGRAM AND NOTES |
| P-100.00 | PLUMBING TITLE SHEET |
| P-200.00 | PLUMBING FLOOR PLAN |
| T-100.00 | TELECOMMUNICATIONS TITLE SHEET AND DETAILS |
| T-200.00 | TELECOMMUNICATIONS FLOOR PLAN,
LIBRARY I.T. ROOM PART PLAN, ELEVATION 'A' AND DETAILS |
| SE-100.00 | SECURITY TITLE SHEET AND DETAILS |
| SE-200.00 | SECURITY FLOOR PLAN, WIRING RISER DIAGRAM AND ELEVATIONS |

SCHEDULE D

Electrical Motor Control Equipment

NO TEXT

SCHEDULE E

Separation of Trades

NOT USED FOR SINGLE CONTRACTS

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 each separate 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: Locascio Architect
 TELEPHONE NUMBER: 7183493714

DATE:

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APPROVED:

(DDC RESIDENT ENGINEER/CPM)

| REPORT DATE | FMS ID #/PROJECT ID #: LBKA05RUG
CONTRACT REGISTRATION #:20050043049
PROJECT NAME: Rugby Branch Library Renovation | CONTRACT #:
EACH TRADE
TRADE:
SHOP DRAWING LOG SHEET # | | | | | | | | | | USE SEPARATE SHEET FOR | | | | |
|---------------|--|---|--------------------|-----------|-----------------|-------------------|------------------|--------|-----------------------|-------|-------|------------------------|-------|-------|---------|-------|
| | | SUBMITTAL | | | SUBMISSION DATE | REQUIRED DELIVERY | FABRICATION TIME | 1 | | | 2 | | | 3 | | |
| SPEC. SECT. # | DESCRIPTION | BROOKLYN LIBRARY APPROVAL REQUIRED | COORD. WITH CONTR. | SHOP DWG. | | | | SAMPLE | CAT. CUTS/ LITERATURE | REC'D | RET'D | ACTIO N | REC'D | RET'D | ACTIO N | REC'D |
| 02000 | Special Public Facility | X | X | X | | X | | | | | | | | | | |
| 02010 | Demolition | | X | X | | | | | | | | | | | | |
| 02081 | Asbestos Abatement | | X | | | | | | | | | | | | | |
| 02085 | Exterior Paint Removal | | X | | | | | | | | | | | | | |
| 02090 | Dust Control | | X | | | | | | | | | | | | | |
| 02100 | Sire Preparation | | X | | | | | | | | | | | | | |
| 02300 | Earthwork | | X | | | | | | | | | | | | | |
| 02780 | Exterior Stone Paving | | X | X | X | X | | | | | | | | | | |

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GENERAL CONSTRUCTION WORK

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SECTION 02000
SPECIAL PUBLIC ACCESS FACILITIES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide a temporary mobile office trailer and related accessories and work, installation and removal. This public access facility is in addition to any mobile trailer facilities indicated elsewhere in these documents.
- B. The contractor shall, for the time frame specified herein, provide and maintain at its own cost and expense a trailer for use by THE CITY OF NEW YORK as a temporary public access facility during construction and all related items as specified herein [hereinafter collectively referred to as the "swing space"] for the exclusive use of THE CITY OF NEW YORK and patrons. The swing space shall be located in the reading garden adjacent to the rugby library renovation project and shall be solely dedicated to the use by THE CITY OF NEW YORK

1.2 QUALITY ASSURANCE

- A. **Regulatory Requirements:** Work of this Section shall conform to all requirements of the NYC Building, Electrical and other applicable Codes and occupancy requirements and all applicable regulations of governmental authorities having jurisdiction, including safety, health, ADA access and anti-pollution regulations for the specified use. Where more severe requirements than those contained in the Building Code or other applicable regulations are given in this Section, the requirements of this Section shall govern.
- B. The contractor shall pay all fees and secure all permits required by the City of New York or other entities with applicable jurisdiction for the special public access facility and all related work.
- C. **Manufacturer's qualifications:**
 - 1. Qualifications of Contractor for work of this Section shall be three (3) years of field experience in work of this nature.
 - 2. The manufacturer must certify in writing all components supplied have been produced in accordance with an established quality assurance program and comply with all applicable building and occupancy codes.
- D. **Installer's qualifications:**
 - 1. Installer must be a trained manufacturer's authorized representative/installer with 3 years experience in the installation of mobile office trailer and related accessories.
- E. **Standards:**
 - 1. Work shall meet the requirements of the following standards:
 - a. Federal, State, and Local codes.

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- F. Risk of Loss: the entire risk of loss with respect to the swing space and equipment shall remain solely and completely with the contractor. This includes all contents, computers and equipment supplied by Brooklyn Public Library. The contractor shall be responsible for the cost of any insurance coverage determined by the contractor to be necessary for the swing space and its contents.
- G. The trailer and built in items shall remain the property of the contractor (this does not include equipment, computers and furnishing provided by BPL)

1.3 SUBMITTALS

- A. Product Literature: Mobile trailer unit and all related accessories.
- B. Shop Drawings:
 - 1. Submit for plan, elevation, accessories and installation.

1.4 SEQUENCING AND SCHEDULING

- A. Perform work in such a manner to ensure a minimum interference with roads, walks, adjacent properties, and facilities to remain open. Do not close or obstruct these items without obtaining permits from the agencies having jurisdiction or the permission of the adjacent owners.
- B. Provision of the swing space shall commence within thirty (30) days from notice to proceed and shall continue through forty-five (45) days after substantial completion of the required construction at the Rugby library project site. The contractor shall remove the swing space forty-five (45) days after substantial completion of the required rugby library project construction, or as otherwise directed in writing by the commissioner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A.. Cassone; Ronkonkoma, NY
- B.. Hale Trailer; Voorhees, NJ
- C.. ModSpace; Farmingdale, NY

2.2 MATERIALS

- A. The trailer shall have equipment in compliance with the minimum requirements hereinafter specified.

B. Trailer access and performance requirements:

1. The contractor shall furnish ADA and NYC code compliant metal, modular stair access to each door and ramp access to door indicated on drawings. Design ramp sections, platforms, steps and railing systems of modular components for on site assembly.
2. Configurations must conform to the following:
 - ramps: maximum slope 1 in 12
 - turn platforms: minimum size 60 in by 60 in clear area
 - steps: minimum 44 inch clear width
3. Design ramp sections, platforms, steps and railing systems to comply with requirements of one or more of the following codes:
 - a. American National Standards Accessible and Usable Buildings and Facilities (ICC/ANSI).
 - b. Americans with Disabilities Act Accessibility Guidelines (ADA).
 - c. Building Officials & Code Administrators National Building Code (BOCA).
 - d. Standard Building Code (SBCCI).
 - e. Council of American Building Officials/American Standards Institute (CABO/ANSI).
 - f. other requirements as listed.
4. Ramp sections and platforms vertical changes in level shall not exceed 1/4 inch:
 - a. Support minimum distributed live load capacity of 100 pounds per square foot.
 - b. Support concentrated vertical load of 300 pounds uniformly distributed over 4 square inches of area.
 - c. Distributed loads and concentrated loads not to be applied simultaneously
5. Handrails located 38 inches above, and parallel to, walking surface with a 1- 2/3 inches grasping rail
 - a. Support distributed load of 50 pounds per linear foot, applied at any point and in any direction.
 - b. Support concentrated load of 200 pounds, applied at any point and in any direction.
 - c. Distributed loads and concentrated loads not to be applied simultaneously.
6. Guardrails located 42 inches above, and parallel to, walking surface
 - a. Support distributed load of 50 pounds per linear foot, applied horizontally at guardrail height and a simultaneous distributed load of 100 pounds per lineal foot applied vertically downward at the top of the guardrail.
 - b. Support concentrated load of 200 pounds, applied at any point and in any direction, including intermediate rails.
 - c. Distributed loads and concentrated loads not to be applied simultaneously.

7. Balusters

- a. Prohibit a 4 inch diameter sphere from passing through any opening.
- b. Support concentrated load of 200 pounds, applied at any point and in any direction.
- c. Balusters shall not be of an open design that would provide a ladder effect.

8. Steps

- a. Support minimum distributed live load capacity of 100 pounds per square foot.
- b. Support concentrated vertical load of 300 pounds uniformly distributed over 4 square inches of area.
- c. Distributed loads and concentrated loads not to be applied simultaneously.
- d. Risers shall be 4 inches high minimum, 7 inches high maximum.
- e. Treads shall be 11 inches deep minimum and have a minimum width of 44 inches.
- f. Treads shall be of uniform depth and risers of uniform height, with differences not to exceed 3/8 inch for any flight or 3/16 inch for adjoining treads or risers. The difference between the uniform riser height and the height of the bottom riser shall not exceed 3 inches.
- g. The leading edge of the tread shall have a radius of curvature of 1/2 inch maximum.
- h. Shall have a handrail on both sides.

C. Swing Space Trailer

- 1. Shall be an office type trailer of the size indicated, with exterior stairs and ramp at entrances. Trailer construction shall be non-combustible construction fabricated to support Live and Dead loads as required for the occupancy type and classification. The trailer construction shall be in accordance with applicable construction and occupancy codes, fully insulated with painted gypsum wallboard interior walls, painted gypsum wallboard ceilings, vinyl tile floors and vinyl base. Colors to be selected by the COMMISSIONER and shall be as established in the applicable section of the specifications.
- 2. Trailer configuration and access shall be ADA compliant.
- 3. Trailer shall be stabilized and leveled in final position with devices as required and shall have a metal skirt painted to match trailer body.
- 4. Trailer Size: length= 60 feet overall/58 feet box; width=12 feet; ceiling height=8'
- 5. Interior layout: provide one (1) general patron use area at one end of the trailer, one (1) private office at the other end of the trailer and bathroom in between, as shown on drawings.
- 6. Equipment and furnishings: the swing space trailer interior shall be furnished by Brooklyn Public Library.
- 7. Exterior signage: Trailer shall be painted color "BPL blue" with lettering as

indicated on the drawings. Paint colors shall be selected by BPL. Paint shall extend across doors and security window guards.

8. **Windows and Doors:** Windows shall be 46" x 27" sliding type and doors shall be aluminum exterior type with vision panel. All windows shall have aluminum insect screens and wire mesh protective guards. Windows and doors shall be trailer supplier standard. Doors shall have same type locks as specified for building renovation work and contractor shall provide 3 sets of master keys to the COMMISSIONER.
9. **Interior:** The interior shall be divided by partitions into general and private office areas as specified herein. Provide an ADA compliant washroom located adjacent to the private office. The washroom shall be equipped with a flush toilet, wash basin with two (2) faucets, medicine cabinet, complete with supplies 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. A remote bell shall be located on outside of trailer.
10. **HVAC:** The trailer shall be equipped with central heating and cooling adequate to maintain a temperature of 72 degrees during the heating season and 75 degrees during the cooling season when the outside temperature is 5 degrees f. winter and 89 degrees f. summer.
11. **Electrical /Data work:**
 - a. Interior lighting shall be provided via ceiling mounted fluorescent lighting fixtures to a minimum level of 50 foot candles in all areas. Broken and burned out lamps shall be replaced by the contractor during entire duration of trailer use. One general illumination light fixture in the patron area and one in the staff office shall be on night time circuits.
 - b. Electrical switches and outlets shall be types as indicated on the drawings for building renovation work at ADA compliant heights.
 - c. Electrical service switch and panel shall be adequately sized for the entire trailer load. Provide dedicated circuits for HVAC units, hot water heater, copiers and other equipment as required. All wiring and installation shall conform to the new york city electrical code.
 - d. All repair work due to these removals shall be the responsibility of the contractor.
 - e. Exterior lighting shall be provided in locations shown on the drawings and shall illuminate the stairs and ramps to a minimum level of 5 foot candles. Lights designated as "night lights" shall be on a separate circuit with fully programmable timer. Remaining exterior lights shall be manually switched from within the trailer.
 - f. Data ports and cabling shall be types as indicated on the drawings for building renovation work at ADA compliant heights.
 - g. Provide (2) ceiling mounted hard wired smoke detectors at locations shown on the drawings.
12. **The following movable equipment shall be furnished:**
 - a. One (1) fire extinguisher one (1) quart vaporizing liquid type, brass, wall mounted by pyrene no. c21 or approved equal.
 - b. 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.

- D. Trailer temporary service: Provide plumbing, electrical and other service and/or work required for the trailer will be furnished and maintained as indicated on the drawings and below.
1. Plumbing service:
 - a. The contractor shall provide temporary water and drainage service connections to the swing space trailer for a complete installation. Provide all necessary soil, waste, vent and drainage piping. Contractor to frost-proof all water pipes to prevent freezing.
 - b. Repairs, maintenance: the contractor shall provide repairs for the duration of the project until the trailer is removed from the site.
 - c. Disposition of plumbing work: plumbing service shall continue until the trailer is removed from the site. At the expiration of the time limit set forth herein, the temporary water and drainage connections and piping to the swing space trailer shall be removed by the contractor 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.
 2. Electrical service:
 - a. The contractor shall furnish, install and maintain a temporary electric feeder to the trailer immediately after it is placed at the job site.
 - b. The temporary electrical feeder and service switch/fuse shall be adequately sized based on the trailer load and installed per the New York City electrical code and complying with utility requirements.
 - c. Contractor shall make all arrangements and pay all costs to provide electric service for the duration of the project..
 - d. The contractor shall 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 the duration of the project and for a period of forty-five (45) days after the date of substantial completion.
 - e. Disposition of electric work: electrical services shall continue until the trailer is removed from the site. At the expiration of the time limit set forth, the temporary feeder, safety switch, etc., shall be removed and disposed of as directed.
 2. Security, voice and data service: the contractor shall provide voice and data service points for the swing space trailer. Contractor shall provide connection to voice, data and security from library building to trailer. These services shall continue until the trailer is removed from the site at which point services from library building shall be disconnected back to main panel.
 3. Maintenance
 - a. The contractor shall provide and pay all costs for regular weekly janitor service and furnish toilet paper, sanitary seat covers, cloth towels and soap and maintain the swing space in first class condition, including all repairs, until the trailer is removed from the site. This service shall be provided when BPL staff are present but before the facility opens to Patrons.
 - b. Supplies: the contractor shall be responsible for providing filtered drinking water and sanitary supplies.

PART 3 – EXECUTION

3.1 VERIFICATION OF CONDITIONS

- A. Verify existing site conditions match those of the survey and pre-bid inspections. Notify the City of New York in writing prior to commencement of Work of any discrepancies.

3.2 The contractor shall install and connect all utility services to the trailer within thirty (30) days from notice to proceed. At forty-five (45) days after the date of substantial completion, or sooner as directed by the commissioner, the contractors shall have all services disconnected and capped to the satisfaction of the commissioner. All repair work due to these removals shall be the responsibility of the contractor

3.3 PROTECTION

- A. Provide adequate protection measures to protect workmen and pedestrians at the site.

- B. Existing Improvements

- 1. Prevent damage to existing improvements designated to remain. If they are damaged during construction, restore improvements to their original condition.
- 2. Prevent damage to improvements on adjoining properties. Restore damaged improvements to their original condition to the satisfaction of their owner.

- B. Existing Trees and Vegetation

- 1. Immediately upon receipt of letter to proceed with construction, the Contractor shall file with the NYC Department of Parks & Recreation (NYC DPR) for permits working on or near street trees or for street tree removal if required for site access. Contractor shall transplant and/or replace street trees and take other actions required by NYC DPR at completion of construction.
- 2. Except for tress or vegetation indicated to be removed, hire a qualified horticulturist or arborist to supervise the protection of and the repair or replacement of damaged trees or other vegetation .
- 3. Protect existing trees and other vegetation to remain from damage due to construction to the satisfaction of the City of New York..
 - a. The Contractor shall be responsible for the protection of tops, trunks, and root systems of existing trees on the project site that are to remain. Existing trees subject to construction damage shall be boxed, fenced, or otherwise protected before any work is started; remove boxing when directed. Do not permit heavy equipment or stockpiles within branch spread. Under the direction of the horticulturist, remove interfering branches without injury to trunks and cover scars with tree paint.
 - b. Where excavating, filling, or grading is required within the branch spread of trees that are to remain, the work shall be performed under the direction of the horticulturist.

- c. Water trees and vegetation as required to maintain their health until project is finished.
- d. When trenching occurs around trees to remain, the tree roots shall not be cut but the trench shall be tunneled under or around the roots by careful hand digging and without injury to the roots.
- e. Protect roots over 1 1/2" in diameter that are cut during construction. Coat surfaces with an acceptable coating and cover exposed roots with wet burlap.
- f. When existing grade at the tree is below the new finished grade and fill not exceeding 16" is required, clean washed gravel graded from 1" to 2" in size shall be placed directly around the tree trunk. The gravel shall extend out from trunk on all sides a minimum of 18" and finish approximately 2" above the finished grade at the tree. Install gravel before any earth fill is placed. New earth shall not be left in contact with the trunks of any trees requiring fill.
- g. Existing trees in areas where the new finished grade is to be lowered shall have regrading work done by hand to elevation indicated. Roots, as required, shall be cut cleanly 3" below finished grade and scars covered with tree paint.

- 4. Repair or replace damaged trees or vegetation to the satisfaction of the City of New York.

D. Salvageable Improvements

- 1. Carefully remove and protect all items to be saved and reused. Replace any items which are damaged by removal at own cost.
- 2. Notify the City of New York in writing of any item which is damaged prior to removal so that they may ascertain the item's condition.

3.4 CLEARING OF SITE

A. Removal and Abandonment of Improvements

- 1. Remove above and below grade improvements, as indicated or directed.
- 2. Remove portions of improvements to remain where necessary to facilitate new construction.

B. Disposal

- 1. Remove and dispose of away from the premises all excavated material of every kind, in a legal manner.
- 2. Burning of material on the site is not permitted.

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C. Ongoing site disposal and clearing.

1. For the duration of construction, Contractor shall keep all patron access areas of the site free from refuse.
2. For the duration of construction, Contractor shall maintain a cleared path for Patrons from property line to trailer doors. This includes snow, leaf and other necessary removals.

3.5 RECONSTRUCTION OF GARDEN

- A. Upon completion of construction, disconnection of all services and removal of trailer, the contractor shall restore the garden to match the preconstruction garden and as indicated on the drawings.

END OF SECTION

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SECTION 02010
SELECTIVE DEMOLITION AND ALTERATION 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. The Work of this Section includes all labor, materials, equipment and services necessary to complete the selective demolition and alteration work as shown on the drawings and/or specified herein, including but is not necessarily limited to the following:
1. Alterations, selective demolition and removals as noted on drawings and as required to accommodate new work.
 2. Removal of debris.
 3. Protection of existing building and spaces to remain, and shoring of the structure as required for structural integrity and personal safety.
 4. Protection of existing curbs and sidewalks.
 5. Temporary coverage passageways, as required by NYC Building Code.
 6. Alterations, selective demolition and removals of exterior facade and other areas where noted.
 7. Patching and refinishing of existing surfaces damaged as a result of this work.
 8. Protection.

1.3 QUALITY ASSURANCE

- A. The Contractor shall comply with the requirements of all applicable Federal, State and local safety and health regulations regarding the demolition of structures including ANSI/NFPD 241-Building Construction and Demolition Operations.
- B. The Contractor shall be responsible for any damage to any adjacent structures or buildings to remain.
- C. Qualifications: Qualifications of Contractor for work of this Section shall be three (3) years of field experience in work of this nature.
- D. **Professional Engineering: The Contractor shall retain the services of a Professional Engineer licensed in the State of New York, shall design and supervise installation of all underpinning and shoring.**

1.4 RELATED WORK

- A. Alteration and removal requirements for mechanical and electrical work - Mechanical and Electrical Sections.

1.5 SUBMITTALS

- A. Schedule of Demolition Operations: Submit demolition procedures and operational sequence for COMMISSIONER's review prior to start of work. Submit a written request to the **Commissioner** well in advance of executing any cutting or alteration which affects:
1. The work of tying in or connecting to operational systems of the building, including electrical, mechanical and security systems.
 2. The work of the CITY OF NEW YORK or any separate Contractor.
 3. The structural value or integrity of any element of the project or of adjacent structures.
 4. The integrity or effectiveness of weather-exposed and moisture-resistant elements or systems.

5. The efficiency, operational life, maintenance, or safety of operational elements or systems.
- B. Notice of Differing Conditions: Submit a written notification if, during the work of demolition and cutting, conditions are discovered which significantly vary from those shown on the drawings. Do not commence work until approval of the **Commissioner**.
- C. **Shop Drawings: Submit the following prior to starting work:**
 1. Submit for the **Commissioner's** information shop drawings indicating location and typical construction details of temporary dustproof and weatherproof partitions.
 2. Submit drawings of temporary structural shoring, bracing, framing or support, for the information of the **Commissioner**. Such drawings will be reviewed by the Structural Engineer for the effects of such temporary members on the structural elements to remain. These drawings shall include the reason for such temporary members, the location, the direction and magnitude of design reaction forces on existing structure, and details showing how these reaction forces will be applied to the existing structure.
 - a. Shop drawings shall be submitted with the Seal of the P.E. engaged by Contractor; P.E. must be licensed in the State of New York.
 - b. The **Commissioner** will receive acknowledgment for concepts shown. Such acknowledgments shall be of the concept only and not of actual capacities or structural design and shall not in any way diminish or limit the Contractor's responsibility for the quality and performance of the work and for protecting existing structures and facilities.

1.6 SPECIAL PRECAUTION

- A. Hazardous materials may be encountered during demolition operations including asbestos; comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

1.7 JOB CONDITIONS

- A. Condition of Structure
 1. The Contractor for the work of this Section shall be held to have visited the site, examined the premises, determined for himself the existing conditions, character of equipment and facilities needed for the performance of the work, and all matters which may in any way affect the work before submitting a bid.
 - a. Information regarding existing construction or conditions is based on available record drawings which may or may not truly reflect existing conditions. Such information is included on the assumption that it may be of interest to the Contractor, the **Commissioner** and consultants do not assume responsibility for its accuracy or completeness.
 - b. Notify the **Commissioner** if, during the course of demolition, conditions are discovered which significantly vary from those shown on the drawings. Do not proceed until authorized by the **Commissioner**.
 2. The Contractor shall accept the condition of the site and structures as found. The **Commissioner** assumes no responsibility for condition of site or structures nor the continuation of the condition existing at time of bidding or thereafter.
- B. Areas of building to be demolished or altered will be vacated and discontinued in use prior to the start of the work.
 1. Surrounding areas of the building shall remain operational by the **City of New York**.
- C. Partial Removal
 1. Items of savable value to the Contractor may be removed from the structure as the work progresses. Salvaged items must be transported from the site as they are removed.
 2. Storage or sale of removed items on the site will not be permitted.

- D. Explosives: The use of explosives will not be permitted.
- E. Traffic
 - 1. Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.
 - 2. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Utilities
 - 1. Refer to Division 15 and 16 of the specifications for special requirements concerning utilities and services.
 - 2. Maintain any existing utilities required to remain; keep in service and protect against damage during demolition operations.
 - 3. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the governing authorities.
 - 4. Disconnect and seal any abandoned utilities before starting demolition operations. Coordinate all work with local utility companies having jurisdiction.

1.8 SCHEDULING

- A. Before commencing any alteration or demolition work, submit for review by the COMMISSIONER, and approval of the City of New York, a schedule showing the commencement, the order, and the completion dates for the various parts of this work.
- B. Before starting any work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.) that will temporarily discontinue or disrupt service to the structures to remain, notify the the Commissioner and the City of New York 7 days in advance and obtain the Commissioner's approval in writing before proceeding with this phase of the work.

PART 2 PRODUCTS

Refer to Part 3 - Execution, for Product Requirements

PART 3 EXECUTION

3.1 PROTECTION

- A. Take full precautions to protect workmen, passersby or any other persons from falling debris and other hazards of demolition operations.
- B. Execute demolition work to insure protection of existing portions of building to remain against damages which might occur from falling debris or other cause. Do not interfere with use of adjacent occupied buildings and areas. Maintain free, safe passage to and from occupied adjacent buildings.
- C. Materials Placement: Do not load structure with weight that will endanger, overload or cause excessive deflection of the existing structure, or that will damage finished surfaces adjacent to and/or supported by the existing structure, except portions being removed.
- D. Construction Operations: Do not employ any construction operation, equipment or vehicles that will endanger, overload or cause excessive deflection of the existing structure, or that will damage finished surfaces adjacent to and/or supported by the existing structure, except portions being removed.
- E. Take precautions to guard against movement, settlement, damage, or collapse of any part of building, sidewalks, adjacent property or street passages; be liable for any such movement,

- settlement or collapse. If such damage does accidentally occur, Contractor shall repair promptly at no cost to **City of New York**.
- F. Provide the necessary safeguards to prevent accidents, to avoid all necessary hazards and protect the public, the work and property at all times, including Saturdays, Sundays, and holidays.
 - G. Be responsible for any and all damages which may arise or occur to any party whatsoever by reason of the neglect in providing proper lights, guards, barriers, or any other safeguards to prevent damage to property, life and limb.
 - H. Make such explorations and probes as are necessary to ascertain any required protective measures before proceeding with demolition and removal. Give particular attention to shoring and bracing requirements so as to prevent any damage to existing construction.
 - 1. Provide interior and exterior shoring, bracing, or support to prevent movement or settlement or collapse of structures to be demolished and adjacent facilities to remain. The Contractor's Professional Engineer shall advise on bracing, shoring, underpinning, or other structural requirements. The Contractor shall bear all responsibility for prevention of movement or other structural fault.
 - 2. The Contractor shall restore, by repair or otherwise, the portions of structure or their contents altered by the Contractor in furtherance of his underpinning and support operations. Restoration shall be completed to the conditions which existed prior to the start of the work. Any damage caused by inadequate support shall also be restored by the Contractor at no cost to the **City of New York**.
 - I. Provide, erect and maintain catch platforms, lights, barriers, weather protection, warning signs, and other items as required for proper protection of the workmen engaged in demolition and alteration operations, occupants of the building, public and adjacent property. Any damage caused by the Contractor's operations shall be promptly repaired by the Contractor at no cost to the **City of New York**.
 - J. Provide and maintain temporary protection of the existing structure designated to remain where demolition, removal, and new work are being done, connections made, materials handled, or equipment moved.
 - K. Take necessary precautions to prevent dust and dirt from rising. Protect unaltered portions of the existing building affected by the operations under this Section by dustproof partitions and other adequate means.
 - L. Provide adequate fire protection in accordance with local Fire Department requirements.
 - M. Do not close or obstruct walkways, passageways, or stairways. Do not store or place materials in passageways, stairs, or other means of egress. Conduct operations with minimum traffic interference.
 - N. Be responsible for any damage to the existing structure or contents by reason of the insufficiency of protection provided.
 - O. Erect temporary covered passageways at street level as required by authorities having jurisdiction.
 - P. Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the **CITY OF NEW YORK**.
 - Q. Provide and maintain weather protection at exterior openings so as to fully protect the interior premises against damage from the elements until such openings are closed by new construction.

3.2 INSPECTION

- A. Verify that areas of demolition work are protected and temporary dustproof partitions have been installed.
- B. Verify that construction to be removed is not load bearing or has been properly braced, framed or supported.

- C. Inspect existing conditions of the project, including elements subject to damage or to movement during demolition and cutting.
- D. After uncovering work, inspect the conditions affecting the installation or performance of the work.
 - 1. Report differing or questionable conditions to the **Commissioner** in writing; do not proceed with the work until the **Commissioner** has provided further instructions.

3.3 PREPARATION

- A. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the work
- B. Provide devices and methods to protect other portions of the project from damage.
- C. Pollution Controls
 - 1. Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
 - a. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
 - 2. Clean adjacent structures and improvements of dust, dirt and debris caused by demolition operations. Return adjacent areas to condition existing prior to the start of the work.
 - 3. Provide drainage for temporary water use.

3.4 DEMOLITION AND CUTTING

- A. Selectively demolish existing construction in conformance with the drawings and these specifications.
 - 1. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surface to receive installation of work by others and patching of finish surfaces.
 - 2. Do all cutting or removal so as to leave neat, true, plumb and square edges, at edges to remain. Use carborundum or diamond saw equipment for cutting masonry, concrete and stone work, where edges or surfaces are to remain.
 - 3. Do not cut or remove construction which might weaken or impair the structural integrity or strength of the structural framing or support systems which are to remain.
 - 4. Demolish and remove materials as shown on the drawings without damage to the remaining parts of the structure or mechanical/electrical/utility systems.
 - 5. Remove materials so as to not impose excessive loads in supporting walls, floors or framing and so as not to damage remaining undemolished portions of the structure.
 - 6. Where portions of structures are to be removed, remaining portions shall be protected from damage and prepared to fit new construction. Damage to portions of structures to remain shall be repaired.
 - 7. Reinforcing steel in existing structures shall be left in place, cleaned and aligned to provide tie with new work.
 - 8. Existing waterproofing systems and flashings shall be carefully exposed and protected to maintain workable conditions of fitting new work with existing construction.
 - 9. Proceed with demolition in a systematic manner.
 - 10. Demolish concrete and masonry in small sections.
 - 11. Remove structural framing members and lower to ground by means of hoists, derricks, or other suitable methods.
- B. Shoring
 - 1. Design, provide, erect and maintain necessary temporary shoring, bracing, framing, or support where load bearing structural or supporting members are removed or weakened by

- cuts or openings or are subject to damage from demolition operations, and otherwise as required for safety or to protect finish surfaces from damage.
2. Construction and adequacy of the shoring shall be the entire responsibility of the Contractor. Any damage caused by the inadequacy of the shoring or other support shall be the responsibility of the Contractor to remedy at no additional expense to the City of New York.
 3. Shoring and bracing shall remain until new structural framing and/or supports are installed. Coordinate operations fully with other trades.
 4. Be ready at any time to promptly provide, add to, or strengthen temporary shoring, bracing, or support for existing work, in case existing construction begins to show signs of structural stress.

3.5 WORKMANSHIP STANDARDS FOR ALTERATION AND REMOVAL WORK

- A. Cut, remove, alter, temporarily remove and replace, or relocate existing work as required for performance of the work. Perform such work required with due care, including shoring and bracing.
- B. Coordinate patching involving the various trades whether or not specifically mentioned in the respective specification Sections.
- C. Materials or items demolished and not designated to become the property of the CITY OF NEW YORK or to be reinstalled shall become the property of the Contractor and shall be removed from the CITY OF NEW YORK's property.
- D. Execute the work in a careful and orderly manner, with the least possible disturbance to the public and to the occupants of the adjacent buildings.
- E. In general, demolish masonry in small sections. Where necessary to prevent collapse of any construction, install temporary shores, struts, or bracing.
- F. Materials to be removed by existing elevators shall be put in enclosed containers.
- G. Where existing equipment and/or fixtures are indicated to be reused, repair such equipment and/or fixtures and refinish to put in perfect working order. Refinish as directed.
- H. Cut out embedded anchorage and attachment items as required to properly provide for patching and repair of the respective finishes.
- I. Confine cutting of existing roof areas designated to remain to the limits required for the proper installation of the new work. Cut and fold back existing roofing. Cut and remove insulation and related items. Provide temporary weathertight protection as required until new roofing and flashings are installed. Consult the CITY OF NEW YORK to ascertain if existing guarantee bonds are in force and execute the work so as not to invalidate such bonds.
- J. Where utilities are removed, relocated or abandoned, cap, valve, plug, or by-pass to make complete and working installation.
- K. Restore existing pipe and duct coverings damaged by work under this Contract to original undamaged condition.
- L. Immediately restore to service and repair any damage caused by Contractor's workmen to existing pipe and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems which are not scheduled for discontinuance or abandonment.
- M. Upon completion of contract, deliver work complete. Damage that may be caused by Contractor or Contractor's workmen to existing structures designated to remain, grounds, and utilities shall be repaired by Contractor and left in as good condition as existed prior to damaging.
- N. Restore finish work of floors, walls, and ceilings remaining in place but damaged or defaced because of demolition or alteration work to condition equal that which existed at beginning of work under this Contract.

- O. Where alteration or removals expose damaged or unfinished surfaces or materials, refinish such surfaces or materials, or remove them and provide new or salvaged materials to make continuous surfaces uniform.
- P. Perform new work and restore and refinish existing work in conformance with applicable requirements of the specifications, except as follows:
 - 1. Materials for use in repair of existing surfaces, but not otherwise specified, shall conform to the highest standards of the trade involved, and be in accordance with approved industry standards, and shall be as required to match existing surfaces.
 - 2. Workmanship for repair of existing materials shall, unless otherwise specified, be equal to similar workmanship existing in or adjacent to the space where the work is being done.
 - 3. Installation of salvaged items where no similar items exist shall be done in accordance with the highest standards of the trade involved and in accordance with approved shop drawings.
- Q. Materials or items designated to become the property of the CITY OF NEW YORK shall be as shown on the drawings. Remove such items with care and store them in a location at the site to be designated by the CITY OF NEW YORK.
- R. Materials or items designated to be reinstalled shall be as shown on the drawings. Remove such items with care under the supervision of the trade responsible for reinstallation; protect and store until required. Replace materials or items damaged in their removal with similar new material.
- S. The existing building shall not be used as a work shop. Neither shall the furnishings or equipment in any room be used as work benches. Should any damage occur during the progress of the work to any furniture, fixtures, equipment, or appurtenances therein, such damage shall be repaired, replaced or made good by the Contractor without extra cost to the CITY OF NEW YORK.
- T. Where removing existing floor finish and base, remove all adhesive and leave floors and walls smooth and flush, ready to receive new finish.
- U. Finish new and adjacent existing surfaces as specified for new work. Clean existing surfaces of dirt, grease and loose paint before refinishing.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General
 - 1. Remove from the site debris, rubbish and other materials resulting from work of this Section.
 - 2. Burning of removed materials from demolished structures will not be permitted on the site.
- B. Removal: Transport materials removed from demolished structures and legally dispose of off site. Pay any and all fees associated with disposal work. Leave the site in an orderly condition to the approval of the COMMISSIONER.

3.7 CLEANING UP

- A. Remove debris as the work progresses. Maintain existing premises in a neat and clean condition.

END OF SECTION

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SECTION 02085
EXTERIOR PAINT REMOVAL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Remove existing exterior paint from masonry and concrete walls where indicated on Drawings and as specified herein.
- B. Remove paint/graffiti by one or more of the following methods, subject to compliance with requirements and systems specified herein:
 - 1. Chemical stripping.
 - 2. Vacuum water blasting.
 - 3. Wet abrasive blasting.
- C. Paint removal methods shall be environmentally safe, and they shall be non-caustic unless otherwise approved in writing by the COMMISSIONER. Procedures shall be effective without causing damage to masonry and other substrates.
- D. All work which disturbs painted surfaces containing lead shall be performed in accordance with the Occupational Safety and Health Administration (OSHA), 29 CFR 1926.62 (Lead in Construction Standard) and US Environmental Protection Agency's (USEPA) 40 CFR 745 regulation. The Contractor shall be familiar with the OSHA and USEPA regulations and their requirements.
- E. In addition, all waste generated as part of the project, regardless of the lead content in the paint, shall be tested in accordance with the United States Environmental Protection Agency (USEPA) Resource Conservation and Recovery Act to determine the classification of the waste.
- F. All waste shall be contained, collected and properly disposed of.
- G. The Contractor shall provide all labor, equipment, tools and materials necessary to complete the Work. The Contractor shall provide all necessary worker safety equipment and material and environmental protection materials necessary to complete performance of the Work in accordance with all prevailing regulations. All workers and supervisors involved in paint removal activities shall possess the required certifications as outlined in 40 CFR 745.
- H. The surfaces on which paint removal activities are to take place may have a number of different existing coatings applied to various masonry materials. The Contractor shall determine which of the removal systems specified herein to use. Where the Contractor determines that a system which is not listed would be better suited to the project, the Contractor shall submit that proposed system to the COMMISSIONER for approval. The contractor shall also arrange for a field demonstration of the proposed system at no cost to the CITY OF NEW YORK. If a substitute system is approved there will be no

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additional cost to the CITY OF NEW YORK. Manufacturer instructions and recommendations shall be strictly followed.

- I. General clean up of the area, which includes the collection of all spent residues, cloth, and placement into proper drums for disposal as specified herein.
- J. The Work performed shall comply with all applicable federal, state and local laws, rules, codes and regulations.
- K. The following methods of paint removal shall not be used:
 - 1. Dry abrasive blasting
 - 2. Uncontained hydro-blasting
 - 3. Open flame
 - 4. Chemical strippers containing methylene chloride
 - 5. Any other method deemed inappropriate or unsafe by the COMMISSIONER.

1.2 QUALITY ASSURANCE

A. Qualifications

- 1. **Cleaning Contractor:** The firm performing the Work of this Section shall have been regularly engaged in masonry paint removal work for a minimum of three years using the cleaning methods specified.

B. Mock-Up

- 1. Before the paint removal operations are started, clean a sample panel of approximately 100 square feet of each type of masonry required to have paint removed at a location on the building directed by the COMMISSIONER. A combination of the various techniques may be required to remove the paint, including graffiti 'ghosting', and the Contractor is to employ any combinations required to obtain a satisfactory sample and finish product at no cost to the CITY OF NEW YORK. If the sample panel is not satisfactory, as determined by the COMMISSIONER, modify the cleaning procedure and clean another sample panel. Continue cleaning sample panels until satisfactory results are obtained and approved by the COMMISSIONER. When a final approval is obtained, go back and re-clean all previously rejected panels. For cleaning procedures other than specified, but which generally follow the method(s) specified, submit proposed procedure for review and clean additional sample panels adjacent to the above sample panels for comparison of results.
- 2. Approved panels and procedures will become the cleaning standard for the Work of this Section.

3. Cover the approved sample panels with six-mil polyethylene plastic mounted on wood frames of adequate size and strength to protect the panels until the completion of Work. The cover shall be easily removable for comparison with completed Work.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cleaning materials in manufacturer's packaging, with instructions for use.
- B. Store, protect, and handle cleaning materials in accordance with manufacturer's instructions.

1.4 PROJECT CONDITIONS

A. Environmental Requirements

1. Make necessary provisions for the diversion and disposal of cleaning water and solutions, including the furnishing of pumps if required. Take precautions as required to prevent damage and contamination resulting from run off of cleaning solution.
2. Do not wet or wash down masonry surfaces when the temperature is below 40°F or may drop below 40°F within 24 hours.

B. Existing Conditions

1. Take necessary precautions and protective measures to prevent injury to people and damage to property in areas adjacent to the Site, including damage due to wind drift of cleaning materials.
2. Pumping equipment will not be allowed in or on the building.
3. Ensure that painted surfaces (such as exterior doors, windows, windowsills, etc.) are not affected by the paint removal, except for those surfaces designated by the COMMISSIONER for paint removal.

1.5 RECORD KEEPING

- A. Contractor shall maintain Record keeping of all exposure monitoring, medical surveillance and other data. These records be kept in accordance with OSHA 29 CFR 1910.20 and also provides employees access to such records.

1.6 HOUSEKEEPING

- A. All surfaces shall be maintained free of accumulation of dust generated during the removal of paint.

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1. Separate and deposit all waste, including sealing tape, plastic sheeting, filters, and disposable clothing in polyethylene bags of at least six (6) mils thick and seal each bag separately.
2. No equipment, supplies or materials (except properly containerized waste materials) shall be removed from the project work area unless such equipment, supplies and/or materials have been cleaned free of debris.

1.7 HYGIENE

- A. Contractor shall provide hygiene facilities and assure employee compliance with basic hygiene practices.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Contractor shall provide and utilize the following products for the project as specified.
 1. Protective Covering (plastic): Six (6) mil polyethylene sheets in sizes to minimize the frequency of joints. Polyethylene shall be flame retardant.
 2. Duct Tape: Duct Tape 2" or wider, or equal, and capable of sealing joints of adjacent sheets of plastic, and for attachment of plastic, and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials, and capable of adhering under both dry and wet conditions, including use of amended water.
 3. Protective Packaging: Appropriately labeled per US DOT; HM 181,126, clear, double six (6) mil sealable polyethylene bags as a minimum.
 4. Impermeable drum containers for the disposal of waste, labeled per USEPA 40 CFR 61 NESHAP Rev. 11/20/90. Provide containers acceptable to the Waste Disposal Facility.
 5. Warning Labels and Signs: As required by OSHA and in accordance with NESHAP Federal Regulations and US DOT Regulations.
 6. Paint Stripper: Chemical stripper test patches shall be applied and evaluated by the manufacturer in order to determine the appropriate stripping compound and dwell time. Refer to the MSDS for all applicable protection and disposal precautions. (NOTE: The Contractor shall use a proven and effective chemical stripper that is safe to workers, public and the environment.)
 - a. Manufacturers/Products
 - 1) AmeriStrip, manufactured by Safe Alternatives Corporation of America Inc., Newport, Vermont (800 258-5665).

- 2) Back to Nature 4-S, manufactured by Nation's Rent Inc., Brooklyn, NY. (718) 387-4872.
 - 3) Peel Away #7, manufactured by Dumond Chemicals, Inc., 104 Interchange Plaza, Suite 202, Monroe Twncsp, NJ 08831 (609)655-7700
7. Graffiti Remover: Chemical stripper designed to remove graffiti not removed by paint strippers.

2.2 TOOLS AND EQUIPMENT

- A. Provide suitable hand scraping tools.
- B. Hepa Vacuums: shall comply with ANSI Z9.2-1979.
- C. Fall protection equipment, including harnesses, ropes and lanyards.
- D. Worker Protection Equipment in accordance with OSHA.
- E. Pump to be used for stripper application shall be either a Grace President Checkmate Air spray System Car. 965-193 or Spray-Quip, Houston, Modified Grace Bulldog or King Pump P/N 397-080, or an approved equivalent.
- F. The Rinse Water Pump: Any paint pump, typically 20:1, which can be fitted with a #621 tip so it delivers 1/3 G.P.M. @ 1000 P.S.I.
- G. Pumping equipment will not be permitted in or on the building.
- H. Scaffolding as specified under Part 3 - Execution.

PART 3 - EXECUTION

3.1 PREPARATION

- A. General Provisions
 1. Dust and debris shall be confined within the work area boundaries and all surfaces shall be free from any visible dust and debris accumulation when the work is completed. Follow the procedures described in this section for each phase of the project.
 2. Work shall not commence until the work area preparation has been inspected and approved by the COMMISSIONER.
 - a. All stairs, platforms and other walking surfaces shall be kept as free as practical from obstructions and accumulation of water. Elevated

platforms shall be protected by OSHA specified top rails, mid-rails and toe boards. A post set-up and daily inspection shall be conducted by the COMMISSIONER.

- b. Ladders of sufficient quantity and of suitable length or height shall be provided. Only electrically non-conductive materials, such as wood or fiberglass, shall be used. Ladders shall be kept in good repair and inspected regularly. Personnel shall be instructed in the proper use of ladders. No structural alterations shall be made to any ladder.
- c. The ladders utilized during this project shall be wet cleaned at the completion of the project.

3. Protection of Existing Work

- a. Protect from damage: glass, fixtures, air conditioners, roofing, flashings, and other surfaces within and adjacent to the Work areas.
- b. Protect from damage landscaping, paving, and other improvements near the building.
- c. Protect and seal all windows and openings within the Work area with a minimum of 1 layer of 6-mil polyethylene sheeting.

B. Chemical Stripping, Hand-Tool Scraping

1. Surfaces Containing Lead-Based Paint

- a. The removal methods of chemical stripping and hand tool scraping shall be accomplished within a hanging or rigid scaffold completely covered in a washable construction tarp or 10-mil polyethylene. The covering need not be airtight; however it must be of adequate size and durability to completely enclose the work area and prevent the dispersal of any paint chips or dust during scraping activities.
- b. At ground level the Contractor shall ensure at the work area is surrounded on all sides by a washable construction tarp or 10-mil polyethylene. The covering need not be airtight; however it must be of adequate size and durability to completely enclose the work area and prevent the dispersal of any paint chips or dust during paint removal activities.
- c. In addition to the covering surrounding the workers, all scaffolding used for the completion of paint removal shall have the working platform covered with a washable tarp. The tarp shall extend from the working platform up the sides of the scaffold to overlap the covering which surrounds the standing workers.
- d. The area directly below the scaffolding or work area shall be covered with a minimum of one layer of 6-mil polyethylene sheeting. This

sheeting shall extend from the working scaffold or work area a minimum of 10 feet in all directions. The sheeting shall be raised on all sides to create a containment for all water used in the paint removal process. As practical and as directed by the COMMISSIONER, the extension of the sheeting shall increase depending on the height of the scaffold and the location of the work.

- e. All windows in the work areas shall be sealed airtight with one layer of 6-mil polyethylene sheeting.

2. Surfaces Not Containing Lead-Based Paint

- a. The Contractor shall ensure that all scaffolding used for the completion of paint removal shall have the working platform covered with a washable tarp. The tarp shall extend from the working platform up the sides of the scaffold.
- b. All windows in the work area shall be sealed airtight with one layer of 6-mil polyethylene sheeting.
- c. The area directly below the scaffolding or work area shall be covered with a minimum of one layer of 6-mil polyethylene sheeting. This sheeting shall extend from the working scaffold or work area a minimum of 10 feet in all directions. The sheeting shall be raised on all sides to create a containment for all water used in the paint removal process. As practical and as directed by the COMMISSIONER, the extension of the sheeting shall increase depending on the height of the scaffold and the location of the work.

C. Wet Abrasive Removal

1. For All Surfaces With Lead Based Paint

- a. The Wet Abrasive removal method shall be performed only when rigid scaffolding is in place. Scaffolding shall be required at all areas of work. The top and all sides (excluding the removal surface) shall be covered with 10-mil, reinforced polyethylene. The covering shall be sealed airtight at all seams and shall be of adequate size and durability to prevent the dispersal of removed debris and water during paint removal activities.
- b. The work area shall be contained on all sides as described in 3.01.C.1.a. above. The floor of the work area shall be covered with a minimum of two (2) layers of 10-mil reinforced polyethylene (or equivalent). The floor sheeting shall extend up the sides of the contained area a minimum of one (1) foot (excluding the removal surface). This sheeting shall be sealed to the sides of the work area to create an impermeable barrier. The floor sheeting shall also extend to the removal surface and be sealed at the base of the removal surface. The Contractor shall ensure that the seal between the floor and the removal surface is sufficient to prevent water leakage.

- c. All windows in the work area shall be sealed airtight with one layer of 10-mil polyethylene sheeting. The Contractor shall install a rigid barrier over the window (consisting of 3/8" plywood or equivalent). This rigid barrier shall completely enclose all components of the window. A second layer of 10-mil polyethylene shall be installed over the rigid barrier and sealed airtight. The integrity of this barrier shall be maintained throughout blasting activities.
- d. The contractor shall install an air filtration system which shall effectively remove airborne particulates from the work area during blasting activities. Such system shall allow for a continuous flow of make-up air from outside the work area and create a negative pressure within the enclosure.

D. Vacuum Water Blasting

- 1. For All Surfaces With Lead Based Paint
 - a. The Contractor shall ensure that all scaffolding used for the completion of paint removal shall have the working platform covered with a washable tarp. The tarp shall extend from the working platform up the sides of the scaffold.
 - b. The area directly below the scaffolding or work area shall be covered with a minimum of one later of 6-mil polyethylene sheeting. This sheeting shall extend from the working scaffold or work area a minimum of 10 feet in all directions. The sheeting shall be raised on all sides to create a containment for all water used in the paint removal process. As practical and as directed by the COMMISSIONER, the extension of the sheeting shall increase depending on the height of the scaffold and the location of the work.
 - c. All windows shall be closed and sealed with one layer of 6-mil polyethylene sheeting. The Contractor shall ensure that no debris or water run-off is found on window surfaces or exterior sills or ledges.
 - d. The Contractor must submit in writing to the CITY OF NEW YORK for approval to use wet abrasive and/or vacuum water blasting methods of paint removal on surfaces containing non-lead-based paint. The submittal shall detail why the method chosen has been selected and demonstrate that the method is more cost effective. Under no circumstances shall these methods be used on non-lead-based paint without permission from the Director of IEH.

3.2 EQUIPMENT

- A. Provide all equipment, tools, materials, services, and facilities required for proper completion of the Work, including but not limited to the following:

All chemical stripper compounds (when applicable), power tools, Valley System vacuum water blasting equipment (when applicable, or equivalent), Torbo wet abrasive blasting equipment (when applicable, or equivalent), HEPA vacuums and any necessary temporary lighting. All electrical power (including Ground Fault Circuit Interrupters) for any electrical needs. Water and sprayers.

3.3 SAMPLE TEST PANEL

- A. Before the removal operations are started, prepare a sample test panel or patch of approximately 50 square feet for each type of substrate, and each method, at locations on the building as directed by the COMMISSIONER. If the sample panel is not satisfactory, as determined by the COMMISSIONER, modify the removal procedure and prepare another sample panel. Continue with additional sample panels until satisfactory results are obtained and approved by the COMMISSIONER.
- B. Approved panels or patches and procedures will become the standard for the Work of this Section.
- C. Cover the approved sample panels or patches with six mil polyethylene plastic mounted on wood frames of adequate size and strength to protect the panels until the completion of Work. The cover shall be easily removable for comparison with completed Work.

3.4 EXECUTION

A. Hand-Tool Scraping

- 1. Scrape loose, peeling, flaking and blistering paint using non-powered hand tools. The surface profile shall comply with SSPC-SP 2 ("Hand Tool Cleaning") and shall be adequate to receive a compatible over coating system.
 - a. Tools shall be non-metallic and shall be limited to natural bristle brushes and scrapers made of natural non-abrasive materials.
- 2. Utilize wet misting techniques by using an airless water sprayer to reduce workers exposure to airborne dust and to prevent the dispersal of such dust outside of the contained work area. After the wet misting procedure, remove all loose, chipped, peeling, flaking and blistering paint. Intact painted surfaces shall not be disturbed during this phase of the removal Work.
- 3. Residue shall be contained by utilizing a HEPA vacuum system.
- 4. All residue, debris, etc. shall be collected in 55 gallon drums and tested prior to disposal.
- 5. All water used in this process shall be handled in accordance with Art. 3.06.

B. Chemical Stripper Compound

- 1. The chemical stripper shall be troweled, brushed or spray applied. Application thickness of the material shall be determined by the sample test patches.

2. The dwell-time for the paint stripper shall be determined by the evaluation of the sample test patches. Once a proper dwell time is determined, the Contractor shall remove the paint and chemical stripping compound onto the polyethylene ground cover or directly into 55 gallon drums. Any remaining residue shall then be washed down with a detergent and water to reveal the bare surface. Wash down of these surfaces is required to remove any remaining residue left by the chemical stripper. The washdown water shall be contained as specified in Art.3.01, B. All water and residue shall be removed by using a wet vacuum system.
3. Apply paste type chemical stripper material to the existing painted surfaces by spray application, and simultaneous application of fibrous laminated cloth, where applicable.
4. Remove all spent chemical stripper, fibrous laminated cloth, and old paint from the substrate manually.
5. Provide low pressure fresh water rinse for cleaning of the substrate to remove any visible residual of remover and old paint.
6. Special care must be taken to remove chemical stripper materials before they dry or harden, to prevent damaging the masonry during the removal process. Any tools used shall be made of natural, non-abrasive materials.
7. When utilizing a chemical stripper, the contractor must determine (by contacting the manufacturer) if the abated surface must be neutralized prior to subsequent paint application. The contractor must also determine if neutralization of the surface is required even if the surface will remain unpainted after paint removal. All concrete, masonry and other porous surfaces shall be tested for moisture levels prior to repainting and shall not be painted until proper substrate moisture level, as specified by the paint manufacturer, has been documented.
8. All water used in this process shall be handled in accordance with Art. 3.06.

C. Wet Abrasive Blasting

1. The Contractor shall follow the manufacturer's recommendation for the operation of equipment. The Contractor shall guarantee that all employees operating the equipment are trained by the manufacturer and have previous experience operating the equipment.
2. The Contractor shall ensure that all water, paint and spent abrasive is recovered and contained.
3. The Contractor shall continuously monitor the exterior of the work area for any visible emissions of water or debris. Work shall stop immediately if emissions are noted. The contractor shall review the integrity of the protective covering and see that all repairs are made prior to starting work again.

4. The COMMISSIONER shall have the right to stop work at any time if visible emissions are noted.
5. All water used in this process shall be handled in accordance with Art. 3.06

D. Vacuum Water Blasting

1. The contractor shall utilize the equipment in strict conformance with the manufacturer's specifications.
2. The Contractor shall apply an approved chemical stripper in accordance with the manufacturer's recommendations, and as specified herein, to paint on the ground floor level of the building. The stripper shall be used to loosen the paint layers prior to vacuum water blasting. The proper dwell time of the paint stripper shall be determined by the contractor based on the manufacturer's recommendations.
3. The contractor shall test the effectiveness of the system on paint of lesser dry film thickness, above the ground floor level (or higher if necessary), to determine proper application of the equipment. If the system can be demonstrated to remove the paint without damage to the substrate, no chemical stripper shall be required. However, if the substrate is damaged by the removal process, a chemical stripper shall be utilized in addition to vacuum water blasting. The stripper shall be applied as specified in Paragraph 3.04. B, "Chemical Stripper Compound."
4. All concrete, masonry and other porous surfaces shall be tested for moisture levels prior to repainting and shall not be painted until proper substrate moisture level, as specified by the paint manufacturer, has been documented.
5. All water used in this process shall be handled in accordance with Section 3.06.

E. Graffiti Removal

Upon complete removal of all paint, underlying graffiti (typically "ghosting") remaining on the exterior building surface is to be removed by applications of graffiti remover. Apply material in accordance with manufacturer's instructions and protect adjoining areas. Upon completion of set time, wash surface with a pressure of no greater than 1000 psi. Perform multiple applications until graffiti is removed. All waste water is to be collected at the base of the wall and disposed of legally off-site.

- F. Whatever method of paint removal is selected, if masonry is damaged in any way by the process, the Contractor shall stop work and notify the COMMISSIONER. The Contractor shall propose modifications to the method of paint removal or another method which will not damage the substrate.

3.5 WORK AREA CLEAN-UP

- A. Clean-up procedures shall utilize HEPA-filtered vacuum systems and/or wet methods, such as mopping, wet-wiping, etc. No dry sweeping of dust and debris is allowed during any phase of the work affecting painted surfaces.

1. A visual inspection will be conducted by the COMMISSIONER to determine that the affected surfaces have been adequately stripped and treated in accordance with this Specification.
2. All visible dust and debris shall be removed from the work area utilizing HEPA-filtered vacuum systems and/or wet methods.
3. All surfaces in the work area shall be HEPA vacuumed.
4. All surfaces in the work area shall be wet-cleaned.
5. A final HEPA vacuuming of all surfaces shall be completed prior to the removal of any polyethylene sheeting.
6. Prior to the dismantling of a containment system, a second visual inspection will be conducted by the COMMISSIONER. This inspection is to determine that the work area is free from any visual accumulation of dust or debris.

B. All water used in clean-up shall be handled in accordance with Art. 3.06.

3.6 DISPOSAL

A. Water

1. Water used to wash abated surfaces and the work area and water used to assist in the removal of paint shall not be disposed of in the City sewer system without first obtaining a permit for such disposal from the New York City Department of Environmental Protection (DEP). Until such a permit is obtained, all water shall be containerized as described in Article 3.06.B.2.a. and b.
2. The Contractor shall ensure that water is separated from solid waste (i.e., paint residue, chemical stripper) and the method used for separation is clearly described in the DEP application.
3. The Contractor shall test the water for the parameters listed below. In addition, the Contractor may be asked by the DEP to test for other parameters not listed.
 - a. Total Petro-Hydrocarbons
 - b. pH
 - c. RCRA Seven Metals
 - d. Cyanide
 - e. Flashpoint
 - f. Total Solids

4. The permit application process is the responsibility of the contractor, as well as the cost incurred by the water testing and analyses.
- B. Conduct TCLP testing of all waste generated.
1. TCLP testing of water is not necessary provided the Contractor has obtained a permit from the DEP for the disposal of water into the City sewer system (See section 3.06.A). If a permit has not been obtained, all water shall be treated according to the procedures described below.
 2. Package and label waste
 - a. All solid waste (and water if no permit has been obtained from the DEP for disposal into the City sewer system) shall be kept drummed, secured, labeled and stored in a designated secured storage space on site until test results categorize all waste to be hazardous or non hazardous.
 - b. The waste media or other debris shall be stored in a manner that will not allow entry of any hazardous material into the environment. Leak-proof drums or portable bins, such as gondolas, are generally acceptable. The lids of the drums, or the covers of the bins, shall be firmly secured. The containers shall be kept out of flood plains or areas where run-off may occur. Weather resistant labels using indelible ink warning of the potential hazards associated with the material shall be placed on the containers. The containers shall be marked with the contents, tare weights of the containers, and the origin and date of collection of the material. The containers shall be keyed to the samples taken.
 - c. All waste, after being evaluated in accordance with the Toxicity Characteristic Leaching Procedure (TCLP) test, shall be disposed of in accordance with all applicable local, Federal, State and county Regulations. Refer to Subparagraph 4 of this Paragraph for testing and disposal standards and regulations. All laboratory analysis shall be conducted in an expeditious manner, with results not to exceed 48 hours turnaround.
 - d. Submit to the CITY OF NEW YORK for approval information regarding the Hazardous Waste Hauler, transport route and disposal site.
 3. Transportation requirements
 - a. The Contractor shall warrant and represent that the entity providing waste transportation services shall possess a valid Waste Hauler's permit issued pursuant to the New York State Department of Environmental Conservation (NYSDEC) regulations, 6 NYCRR Part 364. In addition, if the waste is to be transported and disposed of out of New York State, permits from those states through which the waste will be transported and for where it will be disposed may be required. It is the responsibility

of the Contractor to determine which permits are required and to provide such permits for review and approval of the CITY OF NEW YORK.

4. Storage of waste on site

- a. Site storage involves grouping of materials by particular work site, even though the physical location of the storage site may be separate from the work site itself. Regardless of the location of the storage site, certain requirements remain constant.
- b. The site shall be secure. The storage site shall be in a suitable location, acceptable to the COMMISSIONER. Storage sites shall be on well-drained ground which is not subject to flooding (40 CFR Part 264.18). The area shall be enclosed by a fence or a designated locked area, and prominent warning signs shall be displayed around the perimeter. If the same storage site is also used for equipment and supplies, the waste containers shall be segregated within the site. This can be accomplished by placing all the debris material in assigned area within the secured site and surrounding this area with a temporary "fence" of ribbons or thin rope. Identification and warning signs shall be posted where the material is being stored, and all drums shall be placed on pallets or dunnage to prevent corrosive attack from moist soil. The containers shall be arranged so that the labels are visible at all times. The site shall be adequately protected from vandalism or unauthorized access by the public (40 CFR Part 264.14). A warning sign shall be posted where the waste is being stored, this sign shall read:

*"HAZARDOUS WASTE STORAGE AREA
NO SMOKING OR EATING"*

Note: At the completion of each work shift all hazardous or suspected- hazardous waste generated shall be stored in a suitable container that will prevent unauthorized access to the public. The container shall be constructed with rigid construction materials and have a lockable access door. If this is not feasible, the Contractor shall arrange for the removal of the material each day of the project.

5. Additional disposal requirements

- a. The Contractor shall warrant and represent that all entities and/or individuals involved in the work shall possess all permits and/or licenses required under the Resource Conservation and Recovery Act (RCRA), New York City DEP, as well as any other federal, state or local permits or licenses required for removal, packaging, transportation and disposal of hazardous waste.
- b. All hazardous waste materials removed hereunder shall be lawfully treated and disposed by the Contractor at an Environmental Protection Agency (EPA) permitted Treatment, Storage and Disposal Facility (TSD).

- c. All wastes, drums, and other items removed hereunder shall be lawfully treated and disposed of by Contractor within sixty (60) days after removal from the site. The Contractor shall provide completed shipping documents for all hazardous waste removed, which contain the information required under 40 CFR Part 262 Subpart B (hereinafter the "Manifest Form") and 6 NYCRR Part 372 as well as all Certificates of Disposal which specify where each component of all wastes removed from the CITY OF NEW YORK's property is ultimately treated or disposed. Such Certificates shall include references to the Manifest Form for the shipment as well as address and EPA identification numbers for the generator facility.
- d. Facilities or transporters which the Contractor intends to use to treat and/or dispose of hazardous waste picked up hereunder shall be approved for use by the CITY OF NEW YORK prior to any delivery of waste by Contractor to such TSD facility. The COMMISSIONER reserves the right to inspect the Contractor's transporters, equipment, equipment storage facility and TSD facility at any time.
- e. Shall any problems arise regarding the TSD facility chosen to accept the waste for treatment and disposal that would require the return of waste to the CITY OF NEW YORK, or shall such TSD facility have violated any environmental law or regulation which would result in any regulatory enforcement action, the Contractor shall immediately notify the COMMISSIONER in writing of such situation, identify an alternative TSD and obtain written approval from the COMMISSIONER for disposal at such TSD.
- f. The Contractor shall provide completed shipping documents, hereinafter referred to as "Bills of Lading", for all non-hazardous "industrial" waste removed from the CITY OF NEW YORK's property. A Bill of Lading shall accompany each waste shipment and shall include information regarding the quantity and type of waste being removed, the destination and disposal firm accepting the waste, the waste transporter name, and the date of removal from the CITY OF NEW YORK's site.

END OF SECTION

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SECTION 02090
DUST CONTROL PROCEDURES

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 selective demolition and alteration work as shown on the drawings and/or specified herein, including but is not necessarily limited to the following:
1. Employ dust control procedures as hereafter specified throughout all work of this contract.
 2. Provide all other labor and materials as may be reasonably inferred to be required to make the work of this section complete.

1.3 REQUIREMENTS AND RESTRICTIONS

- A. All materials from cleanup shall be legally disposed of.

PART 2: EXECUTION

2.1 MATERIALS AND EXECUTION

A. Purpose: The purpose of these procedures is to assure that dust and debris are limited to the work area.

B. Work Area Preparation:

1. Cover entrances to the work area(s) with a single layer of 6 Mil polyethylene sheets taped to the top and weighted at the bottom.
2. Place drop cloths of 6 Mil polyethylene sheets adjacent to surfaces to be disturbed. The drop cloths shall be at least 5 ft. wide. The same drop cloth may be used to wrap components to be removed from the work area.
3. Protect CITY OF NEW YORK property and resident belongings in work area by covering them with 6 Mil polyethylene sheets secured with duct tape.

C. Dust Control Procedures:

1. Use wet methods when demolishing walls or other components that produce dust during demolition. Mist all surfaces to be demolished with a fine spray of water, being careful not to develop an excess of water that will cause damage to existing areas of the building that are to remain.

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2. Use power tools where possible. Power tools shall be equipped with a HEPA vacuum capable of trapping and retaining 99.97% of all particles 0.3 micrometers in diameter or greater.
3. Wrap all materials to be removed in 6 Mil polyethylene bags tied with plastic ties at least 5" long. Alternatively, clean by wet methods or HEPA vacuum prior to transport or from the work area.
4. Avoid spreading dust outside the work area.

D. Clean Up Procedures:

1. Remove all accumulations of waste before conducting clean-up procedures.
2. Mist debris with water prior to sweeping (NO DRY SWEEPING PERMITTED) and utilize HEPA vacuums to clean all surfaces.
3. HEPA vacuum all floors and any other surfaces including window sills and window troughs, that might accumulate dust.
4. Wet mop entire area using a cleaning solution-Ledizolv or equivalent which does not contain trisodium phosphate (TSP).
5. Legally dispose of all materials from clean up. Do not discard disposed materials in general collection trash receptacles.

PART 3: NOT USED

END OF SECTION

SECTION 02100
SITE PREPARATION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Miscellaneous site preparation, general site protection and protection of existing trees.

1.02 QUALITY ASSURANCE

- A. Regulatory Requirements

Work of this Section shall conform to all requirements of the NYC Building Code and all applicable regulations of governmental authorities having jurisdiction, including safety, health, and anti-pollution regulations. Where more severe requirements than those contained in the Building Code are given in this Section, the requirements of this Section shall govern.

1.03 EXISTING CONDITIONS

- A. Obtain all Building Department data available on the lot and those adjacent lots affecting or being affected by the project construction.
- B. Prior to clearing and removal or abandonment of improvements, ascertain the exact locations of all existing underground utilities. Protect these during subsequent operations.

1.04 SEQUENCING AND SCHEDULING

- A. Perform work in such a manner to ensure a minimum interference with roads, walks, adjacent properties, and facilities to remain open. Do not close or obstruct these items without obtaining permits from the agencies having jurisdiction or the permission of the adjacent owners.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify existing site conditions match those of the survey and pre-bid inspections. Notify the COMMISSIONER in writing prior to commencement of Work of any discrepancies.

3.02 PROTECTION

- A. Provide adequate protection measures to protect workmen and pedestrians at the site.
- B. Existing Improvements

1. Prevent damage to existing improvements designated to remain. If they are damaged during construction, restore improvements to their original condition.
2. Prevent damage to improvements on adjoining properties. Restore damaged improvements to their original condition to the satisfaction of their owner.

C. Existing Trees and Vegetation

1. Hire a qualified horticulturist or arborist to supervise the protection of and the repair or replacement of damaged trees or other vegetation.
2. Protect existing trees and other vegetation to remain from damage due to construction to the satisfaction of the COMMISSIONER..
 - a. The Contractor shall be responsible for the protection of tops, trunks, and root systems of existing trees on the project site that are to remain. Existing trees subject to construction damage shall be boxed, fenced, or otherwise protected before any work is started; remove boxing when directed. Do not permit heavy equipment or stockpiles within branch spread. Under the direction of the horticulturist, remove interfering branches without injury to trunks and cover scars with tree paint.
 - b. Where excavating, filling, or grading is required within the branch spread of trees that are to remain, the work shall be performed under the direction of the horticulturist.
 - c. Water trees and vegetation as required to maintain their health until project is finished.
 - d. When trenching occurs around trees to remain, the tree roots shall not be cut but the trench shall be tunneled under or around the roots by careful hand digging and without injury to the roots.
 - e. Protect roots over 1 $\frac{1}{2}$ " in diameter that are cut during construction. Coat surfaces with an acceptable coating and cover exposed roots with wet burlap.
 - f. When existing grade at the tree is below the new finished grade and fill not exceeding 16" is required, clean washed gravel graded from 1" to 2" in size shall be placed directly around the tree trunk. The gravel shall extend out from trunk on all sides a minimum of 18" and finish approximately 2" above the finished grade at the tree. Install gravel before any earth fill is placed. New earth shall not be left in contact with the trunks of any trees requiring fill.
 - g. Existing trees in areas where the new finished grade is to be lowered shall have regrading work done by hand to elevation indicated. Roots, as required, shall be cut cleanly 3" below finished grade and scars covered with tree paint.

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3. Repair or replace damaged trees or vegetation to the satisfaction of the COMMISSIONER.

D. Salvageable Improvements

1. Carefully remove and protect all items to be saved and reused. Replace any items which are damaged by removal at own cost.
2. Notify the COMMISSIONER in writing of any item which is damaged prior to removal so that they may ascertain the item's condition.

3.03 CLEARING OF SITE

A. Removal and Abandonment of Improvements

1. Remove existing above and below grade improvements, as indicated or directed.
2. Remove portions of improvements to remain where necessary to facilitate new construction.

B. Disposal

1. Remove and dispose of away from the premises all excavated material of every kind, in a legal manner.
2. Burning of material on the site is not permitted.

END OF SECTION

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SECTION 02300

EARTHWORK

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 earthwork as shown on the drawings and/or specified herein, including but is not necessarily limited to the following:
 - 1. Lay out and stake all lines and levels.
 - 2. Protection and safeguards.
 - 3. Excavating for footings, foundations and below grade construction.
 - 4. Filling and backfilling to attain indicated grades.
 - 5. Preparation of sub-grade for building slab, walks, pavements and grass areas including grading.
 - 6. Aggregate sub-base below concrete slabs.
 - 7. Dewatering.
 - 8. Shoring and bracing.

1.3 JOB CONDITIONS

- A. Dust Control
 - 1. Use all means necessary to control dust on or near the work.
 - 2. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and performance of other work on the site.
- B. Protection
 - 1. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.
 - 2. Provide the necessary safeguards to prevent accidents, to avoid all unnecessary hazards and protect the public, the work and the property at all times, including Saturdays, Sundays and holidays.
 - 3. Be responsible for any and all damages which may arise or occur to any party whatsoever by reason of the neglect in providing proper lights, guards, barriers, or any other safeguards to prevent damage to property, life and limb.
 - 4. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- C. Existing Underground Utilities
 - 1. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

2. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the utility CITY OF NEW YORK immediately for directions. Cooperate with CITY OF NEW YORK and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility CITY OF NEW YORK.
 3. Do not interrupt existing utilities serving facilities occupied and used by CITY OF NEW YORK or others, except when permitted in writing by the COMMISSIONER and then only after acceptable temporary utility services have been provided.
 4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.
- D. Explosives: Do not bring explosives onto site or use in work without prior written permission from authorities having jurisdiction. Contractor is solely responsible for handling, storage, and use of explosive materials when their use is permitted.

1.4 EROSION AND SEDIMENTATION CONTROL

- A. The Contractor is responsible for the performance of all work, furnishing all materials and installing all measures required to reasonably control soil erosion resulting from construction operations and preventing excessive flow of sediment from the construction site. This work must be accomplished in accordance with the requirements of local and state regulatory agencies.

PART 2 PRODUCTS

2.1 ON SITE MATERIAL

- A. All on site material to be used as fill shall be soil or soil-rock mixture which is free from organic matter and other deleterious substances. It shall contain no rocks or lumps over two (2) inches in greatest dimension.

2.2 IMPORTED FILL MATERIAL

- A. Imported fill material shall consist of clean, well graded sand and/or gravel containing less than fifteen (15) percent by weight of materials passing a No. 200 sieve and a maximum particle size of four (4) inches.

2.3 AGGREGATE SUB-BASE BELOW SLAB ON GRADE

- A. Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with one-hundred (100) percent passing a 1-1/2" sieve and not more than five (5) percent passing a No. 4 sieve.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where earthwork 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

- A. Familiarization

1. Prior to all work of this Section, become thoroughly familiar with the site, site conditions, and all portions of the work falling within this Section. Correct any unsatisfactory conditions encountered.

B. Backfilling Prior to Approvals

1. Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections and approvals.
2. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work at no additional cost to the CITY OF NEW YORK.
3. After the work has been completely inspected and approved, make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the CITY OF NEW YORK.

3.3 FINISH ELEVATIONS AND LINES

- A. For setting and establishing layout of building and finish elevations and lines, secure the services of a registered civil engineer or a licensed land surveyor acceptable to the COMMISSIONER. Carefully preserve all data and all monuments set by the civil engineer or surveyor and , if displaced or lost, immediately replace at no additional cost to the CITY OF NEW YORK.

3.4 EXCAVATION

- A. Excavation is unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- B. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimension without specific direction of COMMISSIONER. Unauthorized excavation, as well as remedial work directed by COMMISSIONER, shall be at Contractor's expense.
 1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to COMMISSIONER.
 2. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classifications, unless otherwise directed by COMMISSIONER.
- C. Additional Excavation: When excavation has reached required subgrade elevations, notify COMMISSIONER who will make an inspection of conditions.
 1. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by the COMMISSIONER. Excavation of unsuitable material must extend laterally beyond the edge of the footing or slab for a distance equal to or greater than the required depth of the excavation.
 2. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.
- D. Perform excavation with drip line of large trees to remain by hand, and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of one (1) diameter and larger with emulsified asphalt tree paint.
- E. Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions

- or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- F. **Shoring and Bracing:** Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition.
 - 1. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
 - 2. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
 - G. **Dewatering:** Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.
 - 1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations. Maintain water levels below base of excavation to control hydrostatic pressure on subgrade soils.
 - 2. Establish and maintain temporary drainage ditches and other diversion outside excavation limits to convey rain water and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
 - H. **Material Storage:** Stockpile satisfactory excavated materials where directed until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
 - 1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
 - 2. Dispose of excess soil material and waste materials not re-used.
 - I. **Excavation for Structures:** Conform to elevations and dimensions shown within a tolerance of plus or minimum 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
 - 1. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - J. **Excavation for Pavements:** Cut surface under pavements to comply with cross sections, elevations and grades.
 - K. **Cold Weather Protection:** Protect excavation bottoms against freezing when atmospheric temperature is less than thirty-five (35) degrees F. (1 degree Centigrade).

3.5 COMPACTION

- A. **General:** Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
- B. **Percentage of Maximum Density Requirements:** Compact soil to not less than the following percentages of maximum dry density as determined in accordance with ASTM D1557.
 - 1. **Structures, Building Slabs and Steps, Pavements:** Compact top twelve (12) inches of subgrade and each layer of backfill or fill material to ninety-five (95) percent maximum dry density, at + 2% of its optimum moisture content.

2. Lawn or Unpaved Areas: Compact top six (6) inches of subgrade and each layer of backfill or fill material to eighty-five (85) percent maximum dry density.
 3. Walkways: Compact top six (6) inches of subgrade and each layer of backfill or fill material to ninety (90) percent maximum dry density.
- C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer or soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 - a. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to within + 2% of its optimum moisture content.

3.6 BACKFILL AND FILL

- A. General: Place acceptable soil material in layers to required subgrade elevations for each area classification listed below.
1. In excavations, use satisfactory excavated or borrow material.
 2. Under grassed areas, use satisfactory excavated or borrow material.
 3. Under walks and pavements, use aggregate subbase material.
 4. Under steps, use aggregate subbase material.
 5. Under building slabs, use aggregate subbase material.
 6. Under piping and conduit, use existing subbase material where subbase is indicated under piping or conduit; shape to fit bottom ninety (90) degrees of cylinder.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 2. Inspection, testing, approval, and recording locations of underground utilities.
 3. Removal of concrete formwork after concrete has attained twenty-eight (28) day design strength.
 4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structure or utilities, or leave in place if required.
 5. Removal of trash and debris.
 6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
- C. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than one (1) vertical to four (4) horizontal so that fill material will bond with existing surface.
1. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture condition to optimum moisture content, and compact to required depth and percentage of maximum density.

- D. Placement and Compaction: Place backfill and fill materials in layers not more than eight (8) inches in loose depth for material compacted by heavy compaction equipment, and not more than four (4) inches in loose depth for material compacted by hand operated tampers.
 - 1. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

3.7 GRADING

- A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- B. Grading Outside Building Lines: Grade Areas adjacent to building lines to drain away from structures and to prevent ponding.
 - 1. Finish surfaces free from irregular surface changes.
 - 2. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 feet above or below required subgrade elevations.
 - 3. Walks: Shape surface of areas under walks to line, grade and cross section, with finish surface not more than 0.10 feet above or below required subgrade elevation.
 - 4. Pavements: Shape surface of areas under pavement to line, grade and cross section, with finish surface not more than 1/2" above or below required subgrade elevation.
- C. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a ten (10) foot straightedge.
- D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum density for each area classification.

3.8 BUILDING SLAB AGGREGATE SUB-BASE COURSE

- A. Placing: Place material on prepared subgrade in layers of uniform thickness, conforming to indicated cross section and thickness. Maintain optimum moisture content for compacting material during placement operations.
- B. When aggregate sub base is shown to be six (6) inches thick or less, place material in a single layer. When shown to be more than six (6) inches thick, place material in equal layers, except no single layer more than six (6) inches or less than three (3) inches in thickness when compacted.

3.9 PRESERVATION

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
 - 1. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

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- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.10 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Removal from CITY OF NEW YORK's Property: Remove waste materials, including unacceptable excavated material, trash and debris, and dispose of it off CITY OF NEW YORK's property.

END OF SECTION

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SECTION 02780
EXTERIOR STONE PAVING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work in this section, as shown or specified shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. The Work in this Section includes all labor, materials, equipment and services necessary to install New Exterior Stone Paving Slabs where and as shown on the drawings and/or specified herein.

1.3 SUBMITTALS

A. 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.

B. Shop Drawings: Indicate layout of pavers, edging and curbs, dimensions of paved areas, elevations, and affected adjacent construction.

C. Verification Samples: For each product specified, two samples, minimum size 12 square, representing color range of each selected product.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications:

B. Installer Qualifications: Qualifications of Contractor for work of this Section shall be three (3) years of field experience in work of this nature.

C. Pre-Construction Meeting: Prior to construction of landscape stone, conduct a meeting at the site with the stone materials supplier, the landscape stone installer, and the Contractor to review the retaining wall requirements. Notify the CITY OF NEW YORK and the COMMISSIONER at least 3 days in advance of the time of the meeting.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Prevent excessive mud, fluid concrete, or other deleterious materials from coming in contact with and affixing to landscape stone materials.

1.6 PROJECT CONDITIONS

A. Do not place backfill when subgrade is wet or frozen.

B. Do not place backfill during wet or freezing weather that prevents conformance with specified compaction requirements

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PART 2 MATERIALS

2.1 MANUFACTURERS

- A. Provide products manufactured by Vermont Structural Slate Company, Stone Source, Camera Slate Products or approved equal. The following names and model numbers are those of Vermont Structural Slate Company; other manufacturers noted herein are acceptable subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

2.2 EXTERIOR STONE PAVERS

- A. Heathermoor Slate
 1. Size: 24" wide (typ) x variant length as shown on plan (from building line to storefront/channel glass).
 2. Finish: Cascade or Natural Cleft, as selected by COMMISSIONER.
 3. Thickness: 2"

2.3 ACCESSORY MATERIALS

- A. Setting Bed and Joint Materials: Stone Dust (limestone or traprock screenings) for 2" thk setting bed and swept joint filler and 6" gravel base complying with NYS DOT Item #4.

PART 3 INSTALLATION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify substrate is level, smooth, capable of supporting landscape stone imposed loads.
- C. Verify grades, contours and elevations of substrate are correct.
- D. Verify substrate base supporting landscape stone has been properly compacted.
- E. If substrate preparation is the responsibility of another installer, notify COMMISSIONER of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly of debris, roots, branches and extraneous materials 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 STONE PAVERS SAND SETTING BED

- A. Excavate the rough shape and dimensions of the paving and the lines and grades indicated on the drawings.
- B. Level and compact the base with a plate compactor or hand tamper.
- C. Place the setting bed materials evenly on the prepared grade. Check for level and adjust accordingly.
- D. Dampen and roller compact to level and even surface.
- E. Screed and scarify the top 1/2 inch (13 mm) of stone dust.
- F. Place paver units in the pattern indicated using a straight reference edge.

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- G. Place half units, special shaped units, and curbs at edge and interruptions.
- H. Maintain hand tight joints .
- I. Sprinkle stone dust over surface, sweep into joints and moisten. Recover with additional stone dust until firm joints are achieved. Remove excess dust. Test method before general application to assure no permanent staining of bluestone occurs.
- J. Tamp and level paver units with mechanical vibrator until units are firmly bedded, level, and to correct elevation and gradients.
- K. Recover with additional stone dust, sweep into joints and remove excess dust.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Protect adjacent work areas and finish surfaces from damage during product installation.
- C. Adjust or reset any materials disturbed by successive operations.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

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SECTION 02831
CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide all chain link fence work as indicated on the Drawings and specified herein.

1.02 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- B. American Society for Testing and Materials (ASTM).

A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 psi Tensile Strength.

A392 Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.

F552 Standard Terminology Relating to Chain Link Fencing.

F626 Standard Specification for Fence Fittings.

F1043 Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework.

F1083 Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

1.03 QUALITY ASSURANCE

- A. Qualifications

1. Installer: Company specializing in the installation of the type of fence work specified herein shall have a minimum of 3 years successful experience.
2. Manufacturer: Company specializing in the manufacture of the type of fence work specified herein shall have a minimum of 3 years successful experience.

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1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle fence work materials as recommended by the manufacturer to protect from damage.

PART 2 - PRODUCT

2.01 FENCING

A. Material

1. Framework: max 10' high fences shall have a framework consisting of 2 7/8" OD x .110 wall terminal / 2 3/8" OD x .130 line pipe uprights extending 36" below grade into 12" x 40" concrete footing and 1 5/8" OD horizontal pipe members conforming to ASTM F1043, Group IA, regular strength. Connect with malleable cast iron or pressed steel fittings conforming to ASTM F626, not less than 3/16" thick, and 3/8" minimum diameter bolts conforming to ASTM A307.
2. Fence Fabric: Fence fabric shall be chain link woven steel wire conforming to ASTM A392 of mesh size shown on Drawings. Thickness of uncoated wire shall be 9 gage for 2" mesh and 11 gage for 1" mesh.
3. Wire Ties: Steel and aluminum wire ties shall conform to ASTM F626. Steel ties shall be 9-gage minimum and aluminum ties 6-gage minimum.
4. Locking device:
 - a. Outer Housing - Malleable Iron
 - b. Inner Parts, including Bolt-Stainless Steel, 18-8, 14 gage

B. Corrosion Protection/Finishes

1. Posts and rails shall be hot-dip galvanized in accordance with ASTM F1083, with the weight of zinc coating 2.0 oz per sq ft.
2. Fittings shall be hot-dip galvanized in accordance with ASTM F626, except that the weight of zinc coating shall be 2.0 oz per sq ft.
3. Wire fabric shall be hot-dip galvanized after weaving in accordance with ASTM A392 Class II, weighing 2.0 oz per sq ft of wire surface.
4. Bolts shall be hot-dip galvanized in accordance with ASTM A153.
5. Finished materials shall be free of roughness and sharp edges.

2.02 GATES

- A. Construct of same materials and finishes as the fences; members shall be securely connected as indicated on the Drawings and as required for a rigid, durable assembly.

- B. Provide threaded, slip fittings or welded frame for the construction of the gates as indicated on the Drawings, and as required for a complete installation.
- C. All gates shall be braced with truss rods and turnbuckles as indicated on the Drawings, and as required.

2.03 PIPE SLEEVES

- A. Furnish pipe sleeve with cap (bottom) formed from 16-gage galvanized sheet steel of required diameter and length of setting to concrete mason for installation in concrete walls, piers, and footings. Any cuts or damage to the sleeves shall be machine tool cleaned and coated with galvanizing repair paint conforming to ASTM A780.

2.04 LOCKING DEVICE

- A. Gate locking system shall be similar to that manufactured by Shannon Gates, Deer Park, NY, and consist of three elements:
 - 1. Steel drop bolt arranged to engage the gate stop. The drop bolt shall have a flange that meets a fixed locking eyelet, welded on the gate, to lock the gate in the open and closed position.
 - 2. A rotating locking mechanism consisting of flanges that can be padlocked together
 - 3. Gate stops.
- B. All gates shall be so arranged with all necessary fittings and gate holders that they can be locked when closed and locked back to the fence when open.
- C. All welds shall be ground smooth to a neat finish.

2.05 PADLOCKS

- A. Furnish padlocks for new gates where indicated. Locks to be set up alike: Furnish five (5) keys for all.
- B. Padlock case shall be of $1\frac{3}{4}$ " extruded brass, cornered elliptical shape. The width of the case shall be $1\frac{3}{4}$ ", the depth $1\frac{19}{32}$ " and the thickness $13/16$ ". The shackle shall be of hardened steel cadmium plated with a diameter of $11/32$ ". The width of the opening of shackle from the top of the case to the inside of the shackle shall be $29/32$ ". The shackle shall lock at both the toe and the heel.
- C. Cylinder shall be capable of being keyed individually, keyed alike, masterkeyed and sets and grandmaster keyed as will be directed.
- D. Padlocks shall have 14 gage steel wire chains 9" long attached to lock and riveting pins with rivets and clevis. Chains, rivets, clevis and riveting pins shall be hot dipped galvanized or cadmium plated. Chains shall be galvanized after fabrication.

PART 3 - EXECUTION

3.01 ERECTION

- A. Check each post for vertical and top alignment and hold in position during placement and finishing operations.
- B. Set framework plumb, with the uprights placed in sleeves cast in the walls, piers, or footings and set in with non-shrink grout. Completely fill sockets with grout, crowning the grout to shed water away from the posts.
- C. Space uprights at not more than 10' on center, and set rails top and bottom (and center or diagonal) at ends and next to gates.
- D. At pre-installed sleeves, center post in sleeve prior to installation of grout at base of post.
- E. Where gates occur, provide additional rails and tie rods with the gate posts and fence posts.
- F. Anchor bottom rail of the fence down between posts.
- G. Secure fence fabric to the framework as follows:
 - 1. Top portion of Fence: Secure to framework with aluminum wire with telegraph splice (no less than three full twists) and as indicated on the Drawings. Space wire 16" on centers for both posts and rails.
 - 2. Bottom portion of fence: Secure to framework with galvanized steel wire with telegraph splice (no less than three full twists) and as indicated on the Drawings. Space wires 12" on center on posts and 16" on center on rails.
- H. Knuckle the fence fabric of fences at the top and bottom.

3.02 FIELD TOUCH-UP

- A. Prior to installation of fence post, touch up fence sleeves coating damaged during installation and cut surfaces with repair paint listed below.
- B. After installation is complete, touch-up all fencing members damaged during transportation and erection using galvanizing repair paint conforming to ASTM A780.

END OF SECTION

SECTION 02900
PLANTS

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 DESCRIPTION

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete Planting as shown on the Drawings, as specified herein, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:
 1. Transplanting existing material out of construction zone.
 2. Planting new trees shrubs and groundcovers
 3. Mulch

1.3 SUBMITTALS

- A. 1 lb. sample of bark mulch.
- B. Planting List.
- C. Plant Literature.
- D. Planting shop drawing.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in planting with three (3) years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.
- B. Handle planting stock by root ball.
- C. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.

1.6 SCHEDULING

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- A. Unless otherwise directed by the COMMISSIONER, evergreen material shall be transplanted from April 1st to May 1st, and from September 1st to October 15th. Deciduous material shall be transplanted from March 1st to May 1st and from October 15th to December 1st.
- B. Unless otherwise directed by the COMMISSIONER, deciduous material shall be planted from March 1st to May 1st and from October 15th to December 15th. Evergreen material shall be planted from April 1st to May 15th and from September 1st to October 15th, or as approved by the City of New York.
- C. Grass Seed: March 15 - May 1 Aug. 15 - Oct. 1

1.7 WARRANTY

- A. Failures include, but are not limited to, the following:
 - 1. Death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by City of New York, or incidents that are beyond Contractor's control.
 - 2. Structural failures including plantings falling or blowing over.
- B. Warranty Periods from Date of Substantial Completion:
 - 1. Trees, Shrubs, Ground Covers and Perennials: Two (2) years.

1.8 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.
 - 1. Maintenance Period for Trees and Shrubs, Ground Covers and Perennials: Two (2) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 TREE AND SHRUB MATERIAL

- A. General: 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.

Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1 Retain one or more of five options in first paragraph below or delete paragraph and indicate requirements for each type of tree or shrub on Drawings.

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- B. Provide balled and burlapped trees.
- C. Shrub sizes indicated on Drawings are sizes after pruning.

2.2 GROUND COVER PLANTS

- A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots/flats or similar containers, and complying with ANSI Z60.1.

2.3 PERENNIALS AND VINES

- A. Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed, complying with requirements in ANSI Z60.1.
- B. Vines: Provide vines of species indicated complying with requirements in ANSI Z60.1 as follows:

2.4 WOODCHIP MULCH

- A. Composted, shredded hardwood bark or pine bark with less than 10% sapwood. Dark brown color, uniform size, free of growth or germination inhibiting ingredients.

PART 3 EXECUTION

3.1 PLANTING BED ESTABLISHMENT

- A. Loosen subgrade of planting beds to a minimum depth of 8 inches. Remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off City of New York's property.
- B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.2 PLANTING TREES AND SHRUBS

- A. Excavation of Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.
- B. Excavate approximately three times as wide as ball diameter.
- C. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.
- D. Stock with Root Balls: Set trees and shrubs plumb and in center of pit or trench with top of root ball flush with adjacent finish grades.

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- E. Balled and Burlapped: Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
- F. Container Grown: Carefully remove root ball from container without damaging root ball or plant.
- G. Fabric Bag Grown: Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
- H. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- I. Bare-Root Stock: Set and support bare-root trees and shrubs in center of pit or trench with trunk flare flush with adjacent finish grade. Spread roots without tangling or turning toward surface, and carefully work backfill around roots by hand. Puddle with water until backfill layers are completely saturated. Plumb before backfilling, and maintain plumb while working backfill around roots and placing layers above roots. Tamp final layer of backfill. Remove injured roots by cutting cleanly; do not break.
- J. Organic Mulching: Apply 3-inch average thickness of organic mulch in planting bed.

3.3 TREE AND SHRUB PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character.

3.4 GROUND COVER AND PERENNIAL PLANTING

- A. Set out and space ground cover and plants as indicated.
- B. Dig holes large enough to allow spreading of roots and backfill with planting soil.
- C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

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3.5 PLANTING BED MULCHING

- A. Mulch backfilled surfaces of planting beds and other areas indicated

3.6 PLANT MAINTENANCE

- A. Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
- B. Ground Cover and Perennial Maintenance: Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.
- C. Protect plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

END OF SECTION

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SECTION 02920
SOIL PREPARATION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. The redevelopment plans for the Property include planting areas. Therefore, two feet of certified clean topsoil will be imported from an approved facility and graded across the Site in areas not capped with concrete or asphalt. The certified clean fill/top soil will not be comprised of any construction and demolition debris.
- B. The clean topsoil will be segregated at the facility, and a qualified environmental professional will collect one sample for every 250 cubic yards. The topsoil will be analyzed for Target Compound List (TCL) VOCs, SVOCs, Pesticides, PCBs, and Target Analyte List (TAL) Metals. All samples will be shipped to a NYSDOH ELAP-certified laboratory and will be compared to TAGM 4046.

1.2 QUALITY ASSURANCE

- A. Topsoil used on this project shall be tested, and approved before placement.
- B. Secure approval before stripping topsoil from a borrow area or delivering topsoil to the project site.

PART 2 PRODUCTS

2.1 TOPSOIL

- A. Source: Provide topsoil from areas from which no topsoil has been taken previously and from areas which are producing, or have produced fair to good yield farm crops without unusual fertilization for a minimum period of 3 years, or from arable or cultivable areas supplied with good normal drainage.
- B. Source: Provide topsoil from existing stockpiles stripped from the project site and approved by the COMMISSIONER.
- C. Provide topsoil conforming to the following:
 - 1. Original loam topsoil, well drained homogeneous texture and of uniform grade, without the admixture of subsoil material and entirely free of dense material, hardpan, sod, or any other objectionable foreign material.
 - 2. Containing not less than 5 percent nor more than 9 percent organic matter in that portion of a sample passing a 1/4 inch sieve when determined by the wet combustion method on a sample dried at 105 degrees C.
 - 3. Containing a Ph value within the range of 4.5 to 7 on that portion of the sample which passes a 1/4 inch sieve.
 - 4. Containing the following gradations:

| SIEVE DESIGNATION | PERCENT PASSING |
|-------------------|-----------------|
| 1 inch | 100 |

| SIEVE DESIGNATION | PERCENT PASSING |
|-------------------|---------------------------------|
| 1/4 inch | 97 - 100 |
| No. 200 | 20 - 65 (of the 1/4 inch sieve) |

2.2 LIMESTONE

- A. Provide ground limestone in the producer's standard bags containing not less than 90 percent of calcium and magnesium carbonates equivalent to not less than 45 percent of the mixed oxides of calcium and magnesium and conforming to the following gradations:

| SIEVE DESIGNATION | PERCENT PASSING |
|-------------------|-----------------|
| No. 100 | 50 - 100 |
| No. 20 | 100 |

PART 3 EXECUTION

3.1 PREPARATION

- A. Grub out and remove all vegetation in the area of the approved topsoil source.

3.2 SPREADING TOPSOIL

- A. Perform topsoil spreading operations only during dry weather.
- B. To insure a proper bond with the topsoil, harrow or otherwise loosen the subgrade to a depth of 3 inches before spreading topsoil.
- C. Spread topsoil directly upon prepared subgrade to a minimum depth measuring 4 inches after natural settlement in areas to be seeded. In sodded areas the thickness of the topsoil after natural settlement plus the sod shall equal 4 inches. Smooth out unsightly variations, bumps, ridges, and depressions, which will hold water. Remove stones, litter, or other objectionable material. Finished surfaces shall conform to the contour lines and elevations indicated on the drawings or fixed by the COMMISSIONER.

3.3 SPREADING LIMESTONE

- A. Spread ground limestone evenly over the topsoiled surface. Incorporate limestone within the top 2 inches of soil prior to finish raking.
- B. Apply limestone at the following rate per 1000 sq ft of topsoil area, corresponding to the hydrogen ion concentration (Ph) shown by the soil chemical analysis:

| PH | RATE (pounds) |
|------------|---------------|
| 4.5 to 5.0 | 150 |
| 5.0 to 5.5 | 100 |
| 5.5 to 6.0 | 50 |
| 6.0 to 6.8 | 25 |
| over 6.8 | 0 |

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 (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthrophyllite and actinolite.

GENERAL CONTRACTOR WORK ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

- 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 General 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

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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.

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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.

| <u>PIPE INSULATION
SIZE O.D.</u> | <u>PIPE SIZE
O.D.</u> | <u>SQUARE FOOTAGE
PER LINEAR FOOT</u> |
|--------------------------------------|---------------------------|---|
| 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 1.08, multiplied by the unit price in Section 1.04.

EXAMPLE: 100 lin.ft. of 1/2" pipe and 100 lin.ft. of 6" pipe, including elbows, tees. Flanges, etc.

$$100 \times 0.65 = 65 \text{ sq.ft.} \quad 65 \times \text{unit price} = \text{Payment}$$

$$100 \times 2.62 = 262 \text{ sq.ft.} \quad 262 \times \text{unit price} = \text{Payment}$$

- 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)

$$1000 \text{ S.F.} \times (1.5) \times \text{the Unit Price} = \text{Payment}$$

- 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.

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- 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

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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 Rugby Branch Library, located at 1000 Utica Avenue, Brooklyn, NY 11202.
- 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 drawings labeled "Renovation of the Rugby Branch Library," dated 07/20/15, prepared by Locascio Architect;
 - 2. Asbestos survey reports prepared by Louis Berger & Assoc., P.C. (LBA) dated 06/01/06, 02/20/09 and 10/20/15.
- 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.
 - 2. Cleaning and decontamination of the entire affected area.

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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 floor tile and associated mastic, tar on interior side of exterior walls, roof membrane, chimney metal flashing caulking, exterior window frame caulking, exterior door frame caulking and window glazing.
 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 charges 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 H002.00: First Floor Plan**
 - a. Remove and dispose of asbestos-containing 12"x12" white floor tile & associated mastic, 12"x12" beige floor tile & associated mastic, 9"x9" orange floor tile & associated mastic and tar on interior side of exterior walls within **Work Area 1**. Asbestos-containing floor tiles and mastic shall be removed utilizing NYCDEP Title 15, Chapter 1, § 1-108 Procedures for Foam/Viscous Liquid Use in Flooring Removal. Asbestos-containing tar on interior side of exterior walls shall be removed utilizing NYCDEP Title 15, Chapter 1, § 1-106 Tent Containment Procedures. In areas where VAT is to be removed, the contractor shall be responsible to remove all layers of floor tile and associated mastic to the substrate surface. Multiple layers of floor tile will not be cause for additional compensation to the contractor. All layers of VAT and its associated mastics as well as any plywood and/or particle board in-between layers shall be disposed of as asbestos contaminated waste.

ASBESTOS ABATEMENT

| Work Area | Removal Procedure | Approximate Square Feet (Sq. Ft.) | Approximate Linear Feet (Ln. Ft.) |
|-----------|--|---|-----------------------------------|
| 1 | NYCDEP
Section § 1-108
Foam/Viscous Liquid
Use in Flooring
Removal | 6,675 Sq. Ft. of 12"x12"
White Floor Tile and
Associated Mastic | - |
| | | 825 Sq. Ft. of 12"x12"
Beige Floor Tile and
Associated Mastic | - |
| | | 375 Sq. Ft. of 9"x9"
Orange Floor Tile and
Associated Mastic | - |
| | NYCDEP
Section § 1-106
Tent Containment
Procedures | 800 Sq. Ft. of Tar on
Interior Side of Exterior
Walls | - |

2. Drawing H003.00: Exterior Facades Plan

- a. Remove and dispose of asbestos-containing exterior window frame caulking, exterior door frame caulking and window glazing within **Work Area 2**. Asbestos-containing exterior window frame caulking, exterior door frame caulking and exterior window glazing shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-109 Abatement from Vertical Exterior Surfaces.

| Work Area | Removal Procedure | Approximate Square Feet (Sq. Ft.) | Approximate Linear Feet (Ln. Ft.) |
|-----------|---|--|-----------------------------------|
| 2 | NYC DEP
Section § 1-109
Abatement from
Vertical Exterior
Surfaces | 24 Sq. Ft. of Exterior
Window Frame Caulking,
White and Brown
(560 Ln. Ft. within 25
Masonry Openings) | - |
| | | 5 Sq. Ft. of Exterior Door
Frame Caulking, White
and Brown
(105 Ln. Ft. within 5
Masonry Openings) | - |
| | | 14 Sq. Ft. of Exterior
Window Glazing (660 Ln.
Ft. within 25 Masonry
Openings) | - |

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3. Drawing H004.00: Roof Plan

- a. Remove and dispose of asbestos-containing roof membrane within **Work Area 3**. Asbestos-containing roof membrane shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-107 Foam Procedure for Roof Removal. The asbestos abatement contractor shall be responsible for the removal and disposal of all roofing components, including but not limited to roof membrane and roof flashing down to the substrate/deck.

- b. Remove and dispose of asbestos-containing chimney metal flashing caulking within **Work Area 4**. Asbestos-containing chimney metal flashing caulking shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-109 Abatement from Vertical Exterior Surfaces. The asbestos abatement contractor shall be responsible for the removal and disposal of all roofing components, including but not limited to roof membrane and roof flashing down to the substrate/deck.

| Work Area | Removal Procedure | Approximate Square Feet (Sq. Ft.) | Approximate Linear Feet (Ln. Ft.) |
|-----------|---|--|-----------------------------------|
| 3 | NYCDEP
Section § 1-107
Foam Procedure for
Roof Removal | 150 Sq. Ft. of Roof
Membrane | - |
| 4 | NYC DEP
Section § 1-109
Abatement from
Vertical Exterior
Surfaces | 1 Sq. Ft. (or 12 Ln. Ft.) of
Chimney Metal Flashing
Caulking | - |

- D. The facility is under the jurisdiction of the Brooklyn Public Library. 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.

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- 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 general 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 general 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.
- 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:

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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.
 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.

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- 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 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.

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- 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.
- 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,"

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"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.
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

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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.
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 (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthophyllite and actinolite.

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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.
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.

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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.
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.

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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 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.

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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.
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 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.

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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.
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.

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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.
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.

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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 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.

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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.
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.

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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.

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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.
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.

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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.

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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.

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 registered design professional 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 general 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 general 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 general 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.

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- 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 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.

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1.09 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, 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.

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- f. Description of protective clothing and approved respirator to be used, make, model, NIOSH approval numbers.
- 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.

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- q. 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 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.

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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.

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;

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- 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. 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 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 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 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 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 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.

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- 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)
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

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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
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.

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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.
- 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 WSPS.
- 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.

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- 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.
 - 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.

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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 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.

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- 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.
 - 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.

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- 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 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 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 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.

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- 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 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.

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- 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.
- 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:

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Table 1. -- Assigned Protection Factors⁵

| Type of Respirator ^{1,2} | 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.

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).

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- 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 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.

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- 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.
- 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.

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- 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 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.

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- 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-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).
- 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.

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- 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.
- 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.

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- 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.

- 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 |

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| 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.
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.

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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.
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.

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- 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.
 - 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.

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- 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,
 - 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.

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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
- 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.

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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.
 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.

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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.
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.

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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.
 - 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.

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- 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 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.

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- 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 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.

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- 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.
- 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

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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 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.

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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 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 NYS DOL 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.

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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.
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.

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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.
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 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:

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- (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 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.

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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.
 - 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.

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- (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.
 - (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

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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.
- 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.

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- 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.
- 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.

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- 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 tape. 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;
 - 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;

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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.
 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.

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- 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.

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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.

1. General Requirements:

- a. Removal of ACM shall be performed using wet methods. Dry removal of ACM is prohibited.

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- 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 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.

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- 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.
 - h. Pre-clean all fixed objects to remain within the Work Area using HEPA-vacuum and wet-cleaning techniques.

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- 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.
 - (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.

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- (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.
 - (3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.

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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.
 - (2) All objects and surfaces in the Work Area shall be HEPA - vacuumed and wet cleaned for a second cleaning.

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- (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 NYC DEP § 1-106 Tent 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 polyethylene sheeting. Filters in HVAC systems shall be removed and treated as 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.
 - 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 Contractor. Collected water shall be passed through a

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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 sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.

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- (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. Pre-Removal Inspections

- (1) Prior to removal of any ACM, the 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) 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.

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2. 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 residues shall be removed from the substrate.
3. Following Removal of ACM Utilizing Tent Containment or Tent Procedure:
 - a. Clean all visible accumulations of loose ACM. Metal shovels shall not be used within the Work Area.
 - 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

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applied to any surface that was the subject of removal or other remediation activities prior to obtaining satisfactory clearance air monitoring results. 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, 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 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.

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.

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- e. The Third-Party Air Monitor will conduct final visual. Approval must be granted prior to break down of decontamination facility and 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.
- D. Removal of ACM Roofing and Flashing Materials utilizing NYC DEP § 1-107 Foam Procedure for Roof Removal shall be as follows:
- I. Preparation procedures:
 - a. These procedures apply only to the removal of asbestos-containing roofing material (ACRM) from exterior roof surfaces. The work area on the roof shall be cordoned off with clearly visible barriers such as caution tape, and only authorized persons shall have access.
 - b. The foam or viscous liquid shall be non-toxic, shall not require special respiratory protection for handling, and shall not affect the handling and disposal of the waste.
 - c. The foam or viscous liquid shall coat and maintain a stable blanket (minimum 1" thickness) for the duration of the removal process and shall leave an identifiable colored residue when it dissipates.
 - d. The foam or viscous liquid shall wet the ACRM. The ACRM shall be kept wet through the bagging process.
 - e. Persons entering the work area shall wear correctly-fitting, good traction rubber boots.
 - f. Abatement shall not be carried out during adverse weather conditions (e.g., precipitation, high winds, ambient temperature below 32 degrees Fahrenheit, etc.).
 - g. The worker decontamination unit may be attached to each work area at an entry/exit from each work area, or may be remote, in which case it shall be equipped with an airlock at the entrance. In addition to the shower head(s), the shower room shall be equipped with a flexible hose for waste decontamination for removal of less than 1,000 square feet of ACRM. For 1,000 square feet or more of ACRM removal, a separate waste decontamination facility shall be located at an entry/exit from each work area. Remote holding areas for the asbestos containing waste shall comply with Title 16, Chapter 8, Rules of the City of New York (16 RCNY 8 et. seq.).
 - h. Movable objects shall be removed from the work area, or kept in place and wrapped in one sheet of fire retardant 6 mil plastic sheeting.

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- i. Provisions shall be made to ensure a safe and adequate air supply to affected building(s). All vents, skylights, air intakes, windows and doors opening onto the roof, and all other openings shall be sealed with 2 layers of fire retardant 6 mil plastic or fitting with HEPA filters when appropriate. Temporary extensions may be installed to a height of 10 feet to ensure adequate air exchange instead of sealing vents, air intakes, etc., with 2 layers of plastic or HEPA filters. Drains may be equipped with 5 micron filtering system in lieu of being sealed.
- j. Fixed objects including perimeter walls, bulkheads, cooling towers, ducts and other rooftop appurtenances shall be covered in one sheet of fire retardant 6 mil plastic up to a height of at least six feet.
- k. The asbestos abatement contractor shall be responsible for protection of the interior spaces beneath the roof.
- l. All office equipment and furniture, including but not limited to desks, chairs, computers, printers, cabinets, etc., carpeted and wooden floors shall be covered with one layer of 6- mil plastic sheeting.
- m. The asbestos abatement contractor shall be responsible for any damage that may occur in the interior spaces, including but not limited to office equipment, furniture, floors, etc., beneath the roof during all phases of the roof abatement.
- n. The asbestos abatement contractor shall provide temporary roof protection consisting of 10-mil polyethylene sheeting following abatement over the open roof areas. Strict coordination with the General Asbestos abatement contractor, Construction Project Manager and/or Architect is required and necessary during this phase of abatement.
- o. Preliminary examination shall be conducted and precautions shall be taken to prevent damage to the interior of the building, including but not limited to office equipment, furniture, carpeted and wooden floors, etc., and to ensure no adverse effect on the structural stability of the roof due to the abatement activity.
- p. Abatement activities shall not be carried out during adverse weather conditions (e.g., precipitation, heavy winds, etc.).
- q. The floor area between the remote decontamination facility and the Work Area must be protected with 2 layers of 6-mil. polyethylene sheeting suitably anchored.

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- r. Provisions shall be made to ensure a safe and adequate air supply to affected building(s). All vents, skylights, air intakes, windows and doors opening onto the roof, and all other openings are to be sealed with two layers of 6-mil plastic or fitted with HEPA-filters where appropriate. In lieu of sealing vents, air intakes, etc., with two layers of plastic or HEPA-filters, temporary extensions may be installed to a height of 10 feet to ensure adequate air exchange. Drains may be equipped with 5 micron filtering systems in lieu of being sealed.
- s. 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.
 - (3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.

2. Removal of ACM Roofing and Flashing Materials:

- a. The asbestos abatement contractor shall be responsible for the removal of all roofing components, including multiple layers of built-up membrane, tar, vapor barrier and/or flashing down to the substrate/deck.
- b. Prior to actual removal, the built-up roofing shall be blanketed and wetted with a minimum 1" coating of the acceptable foam or viscous liquid which shall be maintained for the duration of the removal until the material is bagged. The foam or viscous liquid shall be confined to the work area.
- c. Hand-held power tools used to drill, cut into, or otherwise disturb the ACRM shall be equipped with the HEPA-filtered local exhaust ventilation and operated to prevent potential fiber release.
- d. Abatement shall not be performed in adverse weather conditions (e.g., precipitation, heavy winds, etc.). Asbestos abatement contractor shall protect all exposed roof during adverse weather conditions.

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- e. Portable HEPA-vacuum machines shall be available during abatement.
 - f. After the ACM removal and bagging, the bagged waste shall be HEPA-vacuumed, and then wet-cleaned and transferred into the shower room for double bagging. The double-bagged waste shall be transferred outside the clean room for its final transfer for storage in an enclosed waste container.
3. Following Removal of ACM Roofing and/or Flashing:
- a. Upon completion of the abatement in roof work area, clean-up procedures shall involve removal and bagging of:
 - b. The asbestos containing roofing material (ACRM)
 - c. Visible accumulations of asbestos containing waste
 - d. All excess foam or similar viscous liquid
 - e. All debris, and shall be followed by a thorough wet cleaning.
 - f. All tools shall be wet cleaned and HEPA-vacuumed, and then removed from the work area upon completion.
 - g. Following the removal of all debris, the work area shall be thoroughly wet cleaned. The work area shall be allowed to dry completely before the visual inspection is conducted. The inspection shall confirm the absence in the work area of:
 - (1) ACM, debris, bagged ACM waste,
 - (2) Excess foam or other viscous liquid.
 - h. If the work area fails visual inspection, it shall undergo another wet cleaning and/or HEPA vacuuming until it passes the visual inspection.
 - i. When the visual inspection and clearance testing is successful, all plastic may be removed.
 - j. Air monitoring shall be conducted in accordance with the relevant provisions of Air sampling shall be conducted in compliance with NYC DEP Title 15 Chapter 1, §1-41 Air Sampling Schedule.

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E. Removal of Floor Tile and Mastic utilizing NYCDEP Title 15, Chapter 1 §1-108 Foam/Viscous Liquid Use in Flooring Removal procedures shall be as follows:

1. Preparation of the Work Area:

- a. These procedures only apply to the removal of vinyl asbestos floor tiles (VAT), ACM floor coverings and associated mastics and adhesives, where only the ACM being abated in the work area is flooring material.
- b. Request that the Third-Party Air Monitor perform area monitoring and establish a background count prior to the preparatory operations for each removal area.
- c. Provide and install decontamination enclosure systems in accordance with PART 3 - EXECUTION, Sections 3.01 and 3.02 of these Specifications and NYCDEP Title 15, Chapter 1. Decontamination facilities may be remote from the Work Areas upon approval from NYCDEP.
- d. 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 contaminated waste.
- e. 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.
- f. Seal floor drains, sumps and other collection devices with two layers of fire retardant 6-mil 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.
- g. Separate by means of airtight barriers (isolation barriers) parts of the building that are not included in the Work Area(s) from parts of the building that will undergo asbestos abatement.
- h. Seal with isolation barriers: open doorways, cased openings, and corridors that will not be used for passage during work.
- i. Isolation barriers shall extend from the floor to the ceiling and form an airtight seal. They shall be built using 2-inch by 4-inch wood or metal framing placed 16 inch on center and shall be braced as

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necessary. Cover the work sides of the studding with two layers of 6-mil fire retardant, reinforced polyethylene sheeting. Install barriers to form a leaktight seal between the Work Area and adjacent areas. Install isolation barriers in a manner to endure "negative air pressure" within the Work Area.

- j. Completely seal airtight and isolate the Work Area. All openings, including but not limited to doorways, tunnels, ducts, grilles, cracks, diffusers, openings through which pipe conduit passes, and any other penetrations of the Work Area, shall be covered with polyethylene sheeting taped or caulked airtight.
- k. 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 fluorescent 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.
- l. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.
- m. After isolating the area, install and initiate operation of air filtration devices (AFDs) to provide a negative pressure of at least -0.02 inches of water and four air changes per hour within the Work Area relative to surrounding non-Work Areas. In areas where negative air units cannot be exhausted to the exterior of the station, units shall be installed in series. When installing units in series, the exhaust from an AFD shall be exhausted into the intake of a second AFD of equal or greater capacity. The exhaust from the second unit shall be directed to the exterior of the Work Area in an area that is not accessible to the public. Both units shall be located inside the Work Area. Exhaust and connect AFD using spiral-reinforced tubing manufactured for this purpose. Do not shut down AFDs until the Work Area is released to the City following final clearance procedures.
- n. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation.
- o. Scaffolds shall be provided for workers engaged in work that cannot safely be performed from the ground or other solid Work Area surface.

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- p. Work Area Pre-cleaning Procedures: After establishing the decontamination enclosure systems, prepare and pre-clean the Work Area as specified below:
- (1) Movable and loose items not removed by the City shall be cleaned using HEPA vacuum equipment and/or wet cleaning methods as appropriate and shall be removed from the Work Area and stored at the City's direction.
 - (2) Movable and loose items contaminated with asbestos shall be removed from the Work Areas and properly discarded as asbestos contaminated waste.
 - (3) Fixed objects within the Work Area shall be pre-cleaned using HEPA-vacuum equipment and/or wet cleaning methods as appropriate. Joints of covers or casings shall be sealed with tape and fixed objects enclosed with a minimum of two layers of 6-mil fire retardant polyethylene sheeting sealed airtight with tape. Disassembly of these fixed objects is not required unless otherwise noted. Fixed objects shall include, but not be limited to, light fixtures, junction boxes, hangers and black carrying channels.
 - (4) 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.
- q. Plasticize the area after pre-cleaning, using the following procedure:
- (1) Floor surfaces shall be sealed with a minimum of two layers of fire retardant 6-mil plastic sheeting, except where the only ACM being abated in the project is vinyl asbestos floor tile or other flooring material, in which case the floor need not be sealed;
 - (2) Baseboards and wall surfaces shall be sealed with a minimum of two layers of fire retardant 6-mil plastic sheeting up to a minimum height of four feet above the floor. If hand power tools are used during abatement, wall surfaces shall be covered with a layer of fire retardant 6-mil polyethylene sheeting to minimum height of six feet.

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- r. 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.
 - (3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.

2. Removal of ACM Floor Tile and Mastic:

- a. Prior to actual removal, the floor tiles and associated mastic shall be blanketed and wetted with a minimum 1-inch to 3-inch coating of the acceptable foam or viscous liquid that shall leave an identifiable colored residue when it dissipates and shall be maintained for the duration of the removal until the material is bagged.
- b. The foam or viscous liquid shall be non-toxic, shall not require special respiratory protection from handling, and shall not affect the handling and disposal of the waste.
- c. The foam or viscous liquid shall coat and wet the ACM. The ACM shall be kept wet through the bagging process.
- d. Persons entering the work area shall wear correctly-fitting, good-traction rubber boots.
- e. Remove floor tile and all underlying layers using a flat hoe or scraper. Remove adhesive backing using approved mastic removal solvent. Do not grind or sand floor.
- f. Completely remove floor tile and adhesive backing using appropriate tools and materials. As material is removed, wrap it in two layers of plastic and place it in labeled containers for transport.
- g. Completely remove bulk mastic using an approved mastic solvent. Product application shall be in accordance with the manufacturer's instructions and the Material Safety Data Sheet (MSDS) for the product. Do not allow solvent to stand or to be absorbed by sub-floor. Use diatomaceous earth to prevent the flow of solvent under walls or

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- e. If the Work is not approved, the Third-Party Air Monitor will inform asbestos abatement contractor who will then wet-clean and HEPA-vacuum 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.
- f. Remove polyethylene barriers from the walls of the Work Area. Isolation barriers shall remain in place.
- g. Perform a thorough HEPA-vacuuming of the Work Area.
- h. The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
- i. If the Work is not approved, the Third-Party Air Monitor will inform asbestos abatement contractor who will then HEPA-vacuum 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.
- j. If results of air sampling performed during abatement activities indicate airborne fiber concentrations of less than 0.01 fibers per cubic centimeter, or the background level, whichever is greater, final clearance air sampling is not required. The abatement action may be considered complete.
- k. Isolation Barrier Removal
 - (1) Upon receipt of acceptable observation results, polyethylene sheeting and barrier tape shall be removed and disposed accordingly as ACM.
 - (2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA vacuum and wet methods.
- l. The Third-Party Air Monitor will conduct 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.

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- F. Removal of ACM from Vertical Exterior Surfaces utilizing NYCDEP Title 15, Chapter 1 §1-109 Abatement from Vertical Exterior Surfaces procedures shall be as follows:

Preparation procedures: This procedure shall apply to the abatement of asbestos-containing materials from vertical exterior surfaces such as, but not limited to caulking or glazing compounds, asphaltic materials or tar, cement siding or shingles (including transite), paints, sealants coping stone caps or clay roof tiles.

- a. The entire surface to be abated and ground-level perimeter shall be considered the work area unless partitions and warning tape are used to define the work area.
- b. A restricted area shall be established using warning tape extending at least 25 feet from the affected areas of the building or to the nearest vertical obstruction or the curb.
- c. The restricted area may be entered only by certified workers or authorized visitors.
- d. Before plasticizing, the restricted area shall be inspected for ACM debris and, if necessary, pre-cleaned using HEPA vacuums and wet methods.
- e. All openings to the building or structure's interior which are within 25 feet of the affected ACM shall be closed and sealed.
- f. Scaffolding erected to access the ACM shall be constructed, maintained, and used in accordance with applicable federal, state, and city laws.
- g. Horizontal surfaces beneath the affected ACM shall be covered with two layers of fire-retardant 6-mil plastic to a width of six feet.
- h. Elevated platforms being used to access the affected ACM shall be plasticized with two layers of fire-retardant 6-mil plastic, which shall extend up from the platform to at least the height of the mid-rail on three sides, and shall be attached directly to the building just below the surfaces under abatement.
- i. The ground-level restricted area shall be cleared of all moveable objects and plasticized with two sheets of fire-retardant 6-mil plastic, which shall be extended one foot up the side of the building. The plasticized area shall be ten feet wide for every floor up to a maximum width of thirty feet, or to the curb. This plastic shall be cleaned, replaced, and disposed of as asbestos waste at the end of each shift.

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- j. Sidewalk bridges in the restricted area shall be covered with two layers of fire retardant 6-mil plastic, placed over and secured to the bridge, spread across the full width, draped over the side to ground level, and extended to a width of at least thirty feet.
 - k. Establish a remote decontamination unit in accordance with Section 3.01 within the restricted area.
 - l. Construct all elevated work platforms a minimum of one foot below the surface to be abated.
 - m. Pre-Removal Inspections
 - (1) Prior to removal of any ACM, the asbestos abatement contractor shall notify the Project 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.
 - (3) Following the Project Monitor's approval of the Work Area preparations, removal of ACM may commence.
2. Removal of ACM Materials:
- a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.
 - b. Remove the caulk using hand tools such as knives or scrapers.
 - c. Exercise caution when removing caulking material to prevent damage to windows or skylight openings.
 - d. Remove any residual asbestos-containing caulking material from the substrate using wet cleaning methods and nylon-bristled hand brushes. The use of metal bristled brushes is prohibited.
 - e. Place the removed material immediately into a properly labeled 6-mil polyethylene bag. All material shall be properly containerized and decontaminated prior to removal from the Work Area.
 - f. Following the completion of removal of caulking, all visible residues shall be removed from the substrate.

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- g. Air sampling shall be conducted in compliance with NYC DEP Title 15 Chapter 1, §1-41 Air Sampling Schedule. This sampling shall be performed by the Third Party Air Monitoring Firm.
3. Following Removal of ACM :
- a. The stripped substrate shall be HEPA vacuumed and wet-wiped.
 - b. A visual clearance inspection shall be conducted by the asbestos handler supervisor and project monitor after the work area dries, to ensure the absence of ACM residue or debris in the work area.
 - c. After the inspection is completed, the warning tapes and barriers may be removed.
 - d. The clearance inspection shall be documented in the log and the project air sampling log.
 - e. Air monitoring shall be conducted in accordance with relevant provisions.
 - f. 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.
 - g. The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
 - h. 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:
 - (1) All waste shall be removed from the Work Area and holding areas.
 - (2) All tools and equipment are to be removed and decontaminated in the decontamination enclosure system.
 - i. 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.

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- j. Final Barrier Removal
 - (1) Upon receipt of acceptable observation results, polyethylene sheeting and barrier tape shall be removed and disposed accordingly as ACM.
 - (2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA vacuum and wet methods.
 - (3) The Third-Party Air Monitor will conduct 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 method is utilized as part of the invoicing and payment procedures.

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- 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.
 5. Keep ACW separate from any other waste.

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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 containers from the decontamination enclosure holding area. Dress workers moving asbestos waste to storage or disposal facilities in clean overalls of a

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- 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.
- 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.

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- 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 designated representative with signed copies of the waste manifest before each departure.

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- 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 shall be carefully placed in the ground. Do not throw containers from truck.

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- 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 abatement contractor to determine current waste handling, transportation and disposal regulations for the work site and for each waste disposal landfill. The 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.

END OF SECTION 028213

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SECTION 03301
CONCRETE - SITE APPLICATIONS (PAVING)

PART I 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 the installation including all labor, materials, equipment and services necessary to complete concrete paving and trim as shown on the drawings and/or specified herein.

1.3. SUBMITTALS

- A. Shop Drawings: Submit paving plan showing all sidewalk elements, including tree pits, curb cuts, utility poles; control joints; expansion joints; and typical details.

1.4. TECHNICAL REPORT CONCRETE DESIGN MIX

- A. Form TR3: Technical Report Concrete Design Mix: The contractor shall be responsible for, and bear all costs associated with the filing and securing of approvals, if any, for Form TR3: Technical Report Concrete Design Mix, including, but not limited to, engaging the services of a New York City licensed Concrete Testing Lab for the review and approval of concrete design mix, testing, signatures and professional seals, etc., compliant with the NYC Department of Buildings requirements, for each concrete design mix.

PART 2 MATERIALS

- 2.1. A. Concrete shall have proportions of 1 part cement, 1-3/4 parts fine aggregates, 2-3/4 parts coarse aggregates. These proportions shall be measured separately and on a dry basis. The maximum water to be added is 5 gallons per sack of cement. Concrete shall be entrained with controlled air by the use of air entrained Portland Cement or by the admixture of entraining material added at the time of mixing or by a combination of both. Air entrainment in concrete to be 6% to 7%. Concrete shall have a slump of not more than four inches. Concrete shall be a proportion -strength concrete whose constituent materials are proportioned as above and shall have a 4000 PSI strength after curing for 28 days.
- 2.2. A. Cement shall be Portland Cement meeting all requirements for Type I, Type II and/or Type III cement of the Standard Specifications for Portland Cement of the American Society for Testing and Materials designation C 150 and/or C 175. All the cement in any containers in which part of the cement has become caked or deteriorated shall not be used. All cement shall be stored in waterproof enclosures. Cement, if used for mixing on the site, shall be delivered in bags or sacks containing 94 lbs. with the name and brand of the manufacturer, type and weight plainly indicated thereon. All sacks shall be in good condition. Broken or ruptured sacks will be rejected.
- 2.3. A. Coarse aggregate shall consist of broken stone having clean, hard, strong, durable uncoated particles free from soft, friable, thin, elongated or laminated pieces of alkali, organic or other

foreign matter. Broken stone shall be roughly cubical or pyramidal fragments. The coarse aggregate shall conform to the following grading requirements:

| | |
|----------------------------------|----------------------|
| Coarse Aggregate
Broken Stone | Nominal Size
1/2" |
|----------------------------------|----------------------|

Fine aggregate shall consist of sand or crushed stone having clean, hard, strong, rough, durable particles free of soft or flaky material, shale, alkali, loam, lumps or foreign matter. The fine aggregate shall conform to the following grading requirements:

| | | | | | |
|---|----------------------------------|-------------|--------------|--------------|---------------|
| Fine Aggregate
Crushed Stone or Sand | Percent by Weight Passing Sieves | | | | |
| | <u>3/8"</u> | <u>No.4</u> | <u>No.16</u> | <u>No.50</u> | <u>No.100</u> |
| | 100 | 95-100 | 45-85 | 10-30 | 0-6 |

Run of bank gravel will not be accepted for either fine or coarse aggregate.

- 2.4 A. Water for concrete shall be clean and free from acid, alkali, oil, organic or other deleterious substances.
- 2.5 A. Steel reinforcing when required shall be steel reinforcing bars and/or welded, woven wire mesh sheets, (not rolls), of industry standard sizes and as required for application. Reinforcing steel shall be deformed steel bars conforming to ASTM A-615, grade 40. Welded wire fabric shall conform to ASTM A-82 and A-185. When required, plastic, spacer clips shall be provided.
- 2.6 A. Expansion joint filler shall be one of the following types:
 - 1. 1/2 inch wide premolded superior grade, polyethylene, closed cell expansion joint filler. Joint sealant for vertical use shall be a one component, urethane, non-sag grade sealant, joint sealant for horizontal use shall be a one component, urethane, self-leveling. Joint sealant color for uncolored concrete shall be "limestone;" joint sealant for color concrete shall match the concrete color.
 - a. 1/2 inch wide expansion joint filler made from reclaimed, recycled tire rubber rebonded with a polyurethane binder. This material shall be certified by the manufacturer to be in compliance with Article 705-03 - Preformed Rubber Joint Filler, of the current standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering. No joint filler for sealing joints will be required for this specific type of recycled expansion joint filler.
- 2.7 A. Forms for the concrete shall be metal or wood of sufficient thickness to resist distortion. They shall be clean, smooth, without blemishes or raised grain. Forms shall extend the full depth of the concrete, shall be sealed to prevent leakage of concrete and shall be rigidly held in position during construction. Forms shall be cleaned and oiled before every pouring. Ties shall be of the type that snap, without cones, and leave no metal within 1-1/2 inches of the surface. Inserts, anchors, dovetails, anchor bolts, frames, pipe sleeves, dowels, dividing plates and other items shall be installed as specified.
- 2.8 A. Curing material shall be liquid applied as a fine mist with spray gun. It shall dry quickly so that it can be walked upon, being neither slippery nor tacky, but forming a tough film

completely covering the surface. All containers shall have manufacturer's instructions for application and minimum cover lettered thereon. During the first 12 hours, the film shall have a distinct color, all traces of which shall be invisible 7 days later. The material shall have no harmful effect upon the concrete. Three days after application, the curing material film shall retain in the concrete at least 90% of water if tested according to A.S.T.M. Specifications C156-44T.

- 2.9 A. Concrete shall be job-mixed or ready-mixed provided it conforms to the Specifications described therein and meets the requirements of the Building Code of The City of New York.
- 2.10 A. Base course shall be stone screenings or recycled concrete. Stone screenings or recycled concrete shall be clean, hard, durable, sharp angled fragments, stone shall be limestone, or traprock, 100% passing 1/2 inch sieve, 90-100% passing 1/4 inch sieve, 5-15% passing No. 200 sieve by weight. Recycled concrete shall have a maximum fragment size of 3/4". Base course shall be a minimum of 4" deep.

PART 3 CONSTRUCTION

- 3.1 A. The Contractor shall accept the conditions and grades as they exist and shall do all excavating including removals and furnish all clean fill as may be required to establish the compacted subgrade at the required levels, below and parallel with the finished surface of the pavement.
- 3.2 A. Subgrade to receive pavement shall be free of soft or spongy material. Material in soft spots shall be removed to the depth required to provide a firm foundation and shall be replaced with clean fill. The subgrade shall be shaped and compacted with a 5 to 8 ton self-propelled roller. Areas inaccessible to the roller shall be thoroughly compacted with other approved compacting tools. Any work to be constructed below grade must be satisfactorily backfilled before preparation of subgrade is begun. Rolling and compaction of the subgrade shall continue until the surface is hard, uniform, smooth, even-bearing, unyielding and true to grade and cross-section.
- 3.3 A. Paved areas where new concrete pavement is called for shall be excavated to the required depth and old pavements removed from the site.
- 3.4 A. Planted areas where new concrete pavement is called for shall be stripped of existing topsoil to the required depth for the paving. The topsoil shall be stockpiled on the site in areas designated by the Project Superintendent. No topsoil shall be removed from the site without permission of the COMMISSIONER. All debris, vegetation, or other perishable materials shall be removed from the area, except for trees or shrubs designated for preservation.
- 3.5 A. Frames and covers of drainage and other flush surface structures in the construction areas shall be adjusted by the Contractor to the new finished grades. Walls of these structures shall be cut or extended as required. Extensions shall be of brick and mortar, the same thickness as the existing wall. Inside and outside of extension shall be parged with 1:3 cement mortar 1/2 inch thick. Frames of all adjusted structures shall be set on a full bed of mortar. The Contractor shall properly align the frames and covers. He shall provide all safety and protective barricades around open structures.
- 3.6 A. Forms shall be set in place, fastened together and secured in place to resist distortion and misalignment. Forms shall be located with their tops set at the exact finished grades.

Reinforcing bars and/or welded, woven wire mesh shall be set in place and secured to prevent movement while pouring concrete. Bottom bars shall be secured with plastic clips, top bars shall be secured to snap ties. Woven wire mesh shall be secured with plastic chairs, all as specified in Materials Section of these Specifications.

- 3.7 A. Job mixing of concrete shall be done in an approved batch mixer. After all materials, aggregates, cement and water have been placed in the mixer, they shall be mixed for not less than 1-1/2 minutes. For batches larger than one cubic yard, mixing time shall be increased by 15 seconds for each additional cubic yard or until a uniform mixture of concrete is produced. The mixer and other equipment shall be kept clean and free of hardened mortar. The mixer shall be thoroughly cleaned if not used for a period of 30 minutes. Any concrete mixture which has not been placed within 30 minutes from the time water was first added shall not be used.
- B. Ready-mix concrete shall be mixed and transported from the central plant producing the mixture, to the site in approved mixing trucks. After all materials, aggregates, cement and water have been placed in the mixing drum they shall be mixed for a minimum of one minute per cubic yard of material and then an additional two (2) minutes with the drum reversed. The maximum elapsed time from first introducing water to the mix and placing of the concrete shall be one hour.
- C. Each load of concrete shall be certified by the producer to the owner, whether produced at ready-mix plant or site mixed, as to concrete strength and actual quantities per cubic yard of each material, including water contained therein
- 3.8 A. Placing of concrete shall be done as soon as possible after mixing. It shall be thoroughly spaded, rammed and vibrated in place. Vibrators shall be of internal type applied directly in the area of freshly placed concrete and not to the forms. All possible care is to be exercised to prevent voids and honeycomb. No concrete is to be deposited in water nor on frozen subgrade. Concrete shall not be placed when the temperature is below 40 deg. F. Concrete shall contain no frozen materials. Calcium chloride or other admixtures shall not be used as anti-freeze agents. Concrete shall be placed in a continuous operation between expansion joints. Expansion joints shall be installed as shown on the drawings and where new concrete abuts new and/or existing pavements, buildings, steps, curbs, walls, etc. Expansion joints shall be 1/2 inch wide filled with premolded joint filler and sealed with a joint sealant. Joint filler shall be as specified above in Materials Section of these Specifications. The joint filler shall be set 1/2 inch below the concrete surface. To prevent the joint filler from protruding above the surface, expansion joint capping shall be placed over the joint filler. After the concrete has set, the capping shall be removed and the remaining void shall be sealed with 1/2 inch joint sealant. Sealant shall be as specified above in Materials part of this Section. The maximum distance between expansion joints shall be 25 feet unless otherwise shown on the Drawings.
- 3.9 A. Finishing of the concrete shall be done to true smooth planes. The concrete shall be struck off and screeded with not less than two screeding passes to produce a surface which is uniform in appearance, density and composition. The concrete surface shall be worked only sufficiently to embed the coarse aggregate, to close surface voids and to eliminate porous spots. The working shall not be carried to the point where excess mortar or water are drawn to the surface. The surface shall have a final broom finish unless otherwise noted. When the pavement is a walk or a ramp, the direction of the broom finish shall be across the width of

the walk or the ramp, unless otherwise noted. Edges shall be rounded to 1/4" radius by use of an edging tool, unless otherwise shown on the Drawings.

- 3.10 A. Control joint markings shall consist of a groove 1/4 inch wide and 1/2 inch deep and shall be made with an approved tool. They shall be perpendicular and parallel to the curb and building lines and enclose 5 foot by 5 foot panels, or as shown on the Drawings. In the case of sidewalks, if the final width of any concrete area is not divisible by five feet, panels shall be marked uniformly as near as 5 feet as possible or as designated on the Drawings. After the concrete has reached its initial set and is free from excess water, the exposed surface shall be treated with a curing material as specified above in Materials Section of these Specifications.
- 3.11 A. The tops of the curbs/walls shall be finished by trowelling, and all joints and edges shall be tooled with an approved edging tool. Edges of all raised curbs/walls shall be finished with a 1" radius bullnose, unless otherwise shown on the Drawings. After the concrete has reached its initial set and is free from excess water, the exposed surface shall be treated with a curing material as specified above in Materials Section of these Specifications. Forms shall be left in place for a minimum of twenty-four hours.
- 3.12 A. Holes shall be constructed where fence is to be installed. All holes shall be cored, except for corner posts (change in direction) and end posts. Corner and end posts must be formed. Cored holes shall be neatly cored with a water lubricated diamond core drill to produce a smooth hole without damaging existing curb, pavement or footing. Cored holes shall be vertical and true to line dimension. No holes shall be cored until the concrete has cured for a minimum of seven days. Cored holes shall be temporarily sealed until posts are installed.
- 3.13 A. Immediately upon removal of the forms, all exposed surfaces shall be rubbed to a smooth, uniform, and even surface by a soft rubbing brick or carborundum stone. Plastering with mortar, to build up, or to finish, will not be permitted.
- 3.14 A. The Contractor shall have sufficient tarpaulins and guards to protect his work from precipitation, drying effects of the sun and wind, traffic or other hazards at all times. When there is danger of frost or freezing, the Contractor shall maintain sufficient hay or other approved material on the site to protect his work. The Contractor is responsible for protecting and maintaining his work in first class condition during the course of the Contract.
- 3.15 A. Whenever such tests are ordered because original field tests made in accordance with Section C26-10004.5 of the New York City Building Code have shown that the concrete tested was not in compliance with the specifications, then the cost of these tests will be borne by the Contractor. All low results of field tests of concrete will be referred to the designing Engineer for report and recommendation.
- 3.16 A. Any concrete flatwork placed between November 1 and March 31, shall be treated with an approved sealer, such as boiled linseed oil, to protect against de-icer scaling.

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SECTION 03542
CEMENT-BASED SELF-LEVELING UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY OF WORK

- A. The Work of this Section shall include, but not be limited to, installation of hydraulic cement-based self-leveling underlayment (SLU) on the building slab to a uniform, level elevation. Prepare substrate to receive the SLU and install as per this Section and per manufacturer's recommendations.
- B. Provide on all slabs to provide a uniform surface to receive finish.
- C. Moisture content of the concrete slabs shall be checked and documented in writing by the Contractor to ensure the moisture content is acceptable for all materials to be placed on the slab (SLU, finish flooring).
1. Slabs shall be tested utilizing the calcium chloride moisture test and, if required by the floor finish manufacturer, using in-situ test probe method for relative humidity.
 2. New concrete slabs shall be cured a minimum of twenty-eight (28) days for normal weight concrete and 56 days for lightweight concrete prior to testing.
- D. Use of the various ancillary materials listed is dependant on approval of the SLU manufacturer for use in the system with their product. Contractor must have manufacturer's approval for each item to be used.
- E. Utilize moisture mitigation material for all slabs on grade.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM), latest editions.
- C31 Standard Testing Method How to Cast the In-Field F_c and F_i Test Cubes
- C94 Standard Specification for Ready-Mixed Concrete
- C109 Standard Test Method for Compressive Strength of Hydraulic Mortars Using 2-inch or [50mm] Cube Specimens
- C157 Standard Test Method for Length Change of Change of Hardened Hydraulic-Cement Mortar and Concrete
- C191 Test Using Vicat Needle to Determine Final Setting Time of (SLU) Mix
- C596 Standard Test Method to Determine Amount of Water Content in Concrete and Concrete Coatings of Hydraulic Cement Grout (Non-Shrink)
- C1583 Test Method Standard for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Surfaces
- F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

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F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs
Using in situ Probes

1.3 SUBMITTALS

- A. **Product Data:** Submit manufacturer's technical data for all materials, including repair material, primer, self-leveling underlayment, epoxy, and moisture mitigation membrane.

- B. **Quality Control Submittals**
 - 1. **Test Reports:**
 - a. Submit independent laboratory test reports for the performance criteria specified in Part 2 for the SLU (For products not listed).
 - b. **Moisture testing:**
 - 1) Calcium chloride moisture test indicating substrate moisture content is within acceptable limits to receive SLU and finish flooring.
 - 2) Relative Humidity moisture test indicating substrate moisture content is within acceptable limits to receive SLU and finish flooring.
 - 2. **Certificates:** Furnish single-source Manufacturer's certification that materials meet or exceed Specification requirements.
 - 3. **Manufacturer's Instructions:** Furnish manufacturer's printed material, specifications, and application instructions for installation of all component materials to complete the Work of this Section.
 - 4. **Written Repair Procedure:** Submit written copies of procedures of actual process to be utilized to install self-leveling underlayment, including surface preparation and mixing procedures. Procedure is to be signed by manufacturer's representative to certify compatibility of manufacturer's product with substrate.
 - 5. **Manufacturer's Field Reports:** Manufacturer's representative of single-source cement-based self-leveling underlayment shall submit field reports of surface preparation inspection and underlayment placement.
 - 6. **Qualifications:** Provide proof of Manufacturer and Installer qualifications and experience specified under "Quality Assurance".
 - 7. **Installer's Field Schedules**
 - a. Appendix A Schedule completed, dated and signed by individual certified Installer-Applicator.
 - b. Appendix B Schedule completed, dated and signed by individual certified Installer-Applicator.

- C. **Guarantee**
 - 1. Installer's installation guarantee and manufacturer's material warranty.
 - 2. Manufacturer's labor and material warranty for systems with vapor mitigating compound.

- D. Mock-up: Provide mock-up of SLU installation.

1.4 QUALITY ASSURANCE

A. Qualifications

1. Installer/Applicator: An experienced installer/ applicator, trained by the manufacturer to install their system, who has completed cement-based underlayment applications similar in material and extent to that required for this Project, and whose work has resulted in construction with a record of successful continuous in-service performance for a minimum of three (3) years.
2. Manufacturer: A minimum of three (3) years successful continuous experience in the manufacturer of hydraulic cement-based self-leveling underlayments capable of being applied over the varied substrates of existing buildings.

B. Mockups

1. Before installing self-leveling underlayment, apply mockups to demonstrate quantities of materials and execution. Comply with the following requirements, using materials indicated for the completed Work.
 - a. Architect will select one area or surface to represent surfaces and conditions for application on each substrate required.
 - 1) Mock-up of installed underlayment shall be no less than 3'-0" X 3'-0" and preferably shall be 6'-0" X 6'-0".
 - 2) Mock-up of installed underlayment shall be prepared *in-situ* and shall be retained *in-situ* as example of quality of installation as well as underlayment mix.
 - 3) Mock-up of installed underlayment will be inspected no less than 7 days old.
 - b. Notify THE CITY OF NEW YORK seven days (7) in advance of dates and times when mockups will be applied.
 - c. Obtain THE CITY OF NEW YORK approval of mockups before starting underlayment application.
 - d. Maintain mockups, during underlayment application and until installation of finish flooring, in an undisturbed condition as a standard for judging the complete work.
 - e. Approved mockups may become part of the completed work if undisturbed when finish flooring is installed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage, mixing with other components, and application. Do not break open manufacturer's factory seals of any component packaging until installation.

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- B. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental conditions.
- C. Keep all self-leveling underlayment components on a clean dry pallet raised up from the floor the pallet is sitting on in a temperature-controlled and humidity-controlled, secured and locked room until actual incorporation into the Work of this Section.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install self-leveling underlayment until floor penetrations and peripheral work is completed. Where placed on new concrete, concrete slab shall have cured a minimum of 28 days for normal weight concrete and 56 days for lightweight concrete and is dependant on results of moisture testing for both SLU and finish flooring. Testing shall be done under the conditions described in B below.
- B. Maintain ambient conditions to which the floor will be maintained under in-situ conditions. Buildings that are or will be air conditioned shall have conditions maintained at a temperature of 78°F together with 50% relative humidity for seventy-two (72) hours continuously prior to installation of underlayment and for the same period after in the space below as well as the space in which the material is being placed. Provide temporary equipment to provide such conditions. Do not utilize forced cooling or heating that produces rapid air movement, which will result in premature wicking of moisture affecting setting and surface of the SLU setting for the first 24 hours after placement. Do not install in temperatures below 50°F or over 90°F. Comply with manufacturer's written recommendations for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting self-leveling underlayment material's performance.
- C. Close areas to traffic during underlayment application and for a minimum twenty-four (24) hour period after installation-application (longer if needed due to actual installation conditions or material type as recommended in writing by manufacturer).

1.7 COORDINATION

- A. Coordinate cement-based underlayment with requirements of finish flooring products, including adhesives.
 - 1. Before installing surface sealers recommended by underlayment manufacturer, if any, verify compatibility with finish installation adhesives.
 - 2. For existing construction, coordinate use of ACM materials encapsulant used under requirements of section 02081 with SLU manufacturer's requirements for substrate preparation and use of primer/bonding agent.

1.8 WARRANTY

- A. Provide Manufacturer's five-year warranty covering defects in materials.
- B. Provide Contractor's one-year guarantee covering materials and workmanship that self-leveling material will not fail or cause failure of finish material.
- C. For surfaces receiving moisture mitigation membrane, manufacturer's ten-year material and labor warranty against failure of those materials placed on the material due to the affects of moisture migration or bond.

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PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Self-leveling underlayment and repair material

1. Ardex Inc.
400 Ardex Park Dr, Aliquippa, Pennsylvania 15001
2. Dayton Superior Chemical Division
4226 Kansas Avenue, Kansas City, KS 66108.
3. Silpro LLC
2 New England Way, Ayer, MA 01432
4. CMP Specialty Products, Inc
1445 Ford Road, Bensalem, PA 19020
5. MAPEI Corp
1144 E Newport Center Dr, Deerfield Beach, FL 33442
6. LATICRETE DRYTEK Innovative Flooring Solutions
1 Laticrete Park North, Bethany, CT 06534
7. LATICRETE SUPERCAP LLC and LATICRETE INTERNATIONAL, Inc.
1 Laticrete Park North, Bethany, Ct, 06524

B. Moisture Mitigation Membrane

1. Koester American Corp.
2585 Aviator Drive, Virginia Beach, VA 23453
2. Sinak
1949 W. Walnut Ave, San Diego, CA 92101
3. Ardex
400 Ardex Park Dr, Aliquippa, Pennsylvania 15001
4. CMP
1445 Ford Road, Bensalem, PA 19020
5. Silpro LLC
2 New England Way, Ayer, MA 01432
6. MAPEI Corp
1144 E Newport Center Dr, Deerfield Beach, FL 33442
7. Drytek Innovative Flooring Solutions
1 Laticrete Park North, Bethany, CT 06534
8. LATICRETE SUPERCAP LLC and LATICRETE International, Inc.
1 Laticrete Park North, Bethany, Ct, 06524

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- C. Material Coordination: Contractor shall provide systems and materials compatible with and acceptable to the SLU manufacturer. Where moisture mitigation membrane is placed, the Contractor shall test the installation of the SLU on the moisture mitigation membrane with the moisture mitigation membrane manufacturer to ensure proper bond is achieved and ensure the warranty against failure will be received.

2.2 MATERIALS

- A. General: All self-leveling underlayments are to be hydraulic cement based materials capable of being installed in spaces subject to moisture without degradation under wet conditions. The products listed have been tested by laboratory mock-ups utilizing ASTM testing or through successful field testing. No other products will be accepted without going through the testing procedure, which is to be at the manufacturer's cost. Use of materials specified is also dependant on manufacturer's requirements, in which they may not permit the installation on certain substrates due to their material properties. Moisture mitigation membranes, installed prior to application of the SLU, must be acceptable to the SLU manufacturer. Contractor shall be aware that drying times for products before which installation of finishes can be placed vary between products and thus shall take that time into account in the schedule when selecting products.
- B. Material/Performance Testing to be performed for product not listed – THE CITY OF NEW YORK will compare the following against accepted materials. Provide photographs at all stages including the petrographic testing.
1. Sulfate testing per ASTM C114
 2. Compression strength test as per ASTM C109: For both specified amount of water and with additional 1 quart listing testing at 7 days and 28 days.
 3. Shrinkage testing per ASTM C596: For both specified amount of water and with additional 1 quart listing testing at 7 days, 14 days, 21 days, and 28 days.
 4. Bond tensile pull in accordance with ASTM C1583.
 5. Mixing and placement - For both specified amount of water and with additional 1 quart – Petrographic analysis in accordance with ASTM C1324
 - a. Material Segregation during mixing
 - b. Material segregation after placement and hardening. Sections taken shall clearly show the bond line and the aggregate within matrix.
 6. In-situ testing - For both specified amount of water and with additional 1 quart: Placement on a 4x4 slab of lightweight structural concrete, with photographs. If deemed appropriate by the CITY OF NEW YORK , photographic evidence from other projects may be acceptable.
- C. Self-Leveling Underlayment for placement on Hard Concrete Surface (Minimum $f'c = 4,000$ psi)
1. Primers:
 - a. Ardex Primer P-51

- b. Dayton Superior J-42 Primer
- c. Silpro C-21, Silflo Primer
- d. CMP AS-100 Primer
- e. MAPEI Planiprep SC
- f. LATICRETE DRYTEK Levellex Primer
- g. LATICRETE SUPERCAP Primer Plus

2. Flash Patch:

- a. Ardex SD-F Feather Finish
- b. Dayton Superior Sure Finish
- c. Silpro Skim Pro
- d. CMP PrepStar
- e. MAPEI Mapecem Fine Finish
- f. LATICRETE DRYTEK Skimcoat
- g. LATICRETE SUPERCAP Skimcoat

3. Self-Leveling Underlayment – Self-drying (can be covered in less than 16 hours regardless of thickness):

- a. Ardex K-15
- b. Dayton Superior Levelayer
- c. Silpro Silflo 220
- d. CMP LF-210 & H2-O
- e. MAPEI Ultraplan 1 plus
- f. DRYTEK DRYTEK Levellex Plus

4. Self-Leveling Underlayment – standard-drying (can be covered in 24-72 hours, depending on thickness):

- a. Silpro Silflo 230
- b. CMP Level 1

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3. Floor Seal Technology, Inc. San Jose, CA 95112
4. Wagner RH
5. Tramex RH

2.3 PRE-INSTALLATION MEETING

- A. Conduct a pre-installation meeting with the manufacturer's representative to review the methods and procedures, including surface preparation, for a satisfactory self-leveling underlayment installation.
- B. Meeting shall occur with sufficient time to have submittal, procedures, and test panels completed prior to work progressing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present for conditions affecting performance of underlayment including substrate moisture content. Begin underlayment application only after unsatisfactory conditions have been corrected and substrate condition inspected and approved by the manufacturer's representative and by Architect/Engineer. SLU installer shall not proceed until above required environmental conditions can be verified and recorded on provided Schedules for a minimum of seventy-two (72) hours prior to SLU application in respective space.
- B. Perform moisture tests on concrete subfloors to determine if surfaces are sufficiently cured and dry by either of the two following test methods. Depending on ambient conditions, one test may be more appropriate than the other due to possibility of false positives. Coordinate with underlayment manufacturer. The values indicated shall be verified with the manufacturer of the actual floor finish material:
 1. Tests in accordance with ASTM F1869: Moisture vapor transmission shall not exceed 3 pounds per 1,000 square feet in 24 hours.
 2. Tests in accordance with ASTM F2170: Relative Humidity shall not exceed 75%.

3.2 PROTECTION

- A. Protect substrate and materials from freezing before and after installation.
- B. Protect adjacent finish materials and previously poured concrete slabs and SLU against spatter during SLU placement.

3.3 REMOVAL/DEMOLITION

- A. The pattern and extent of the demolition and removal of the deteriorated materials shall be per engineer's recommendations. The following shall be followed:
 1. Overcut: The removal of the deteriorated material shall extend laterally at least 6" into sound material. A pattern outlines the extent of removal shall be established so when removal is complete, there will be no loose material left. The new substrate will be built on and around sound materials.

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2. Undercut: When metal, rebar or reinforcing mesh are encountered, at least 3/4" of the substrate material under the reinforcing shall be removed to allow proper bond between the reinforcing bars and the new material.
3. Cutback: Residual mastic on old surface shall be removed.

3.4 SURFACE PREPARATION

- A. Existing Substrates: The surface of the existing substrate where the new self-leveling underlayment is to be applied shall be thoroughly shot-blasted and cleaned to an ICRI CSP3-5 minimum surface preparation, or greater if required by SLU manufacturer. Machine grinders with HEPA attachments such as the Hilti DG150 are acceptable for those substrates that are subject to asbestos abatement or where shot blasting equipment use is not feasible, such as cinder fill concrete, and will be able to produce the profile required by the SLU manufacturer. Use of a scarifier or scabblers is prohibited. The surfaces that are to receive new substrate material shall be free of laitance, asphalt, old paint, mastic, etc. that may inhibit bond between the old and the new material. Chemical treatment of the substrate (acid etching, citrus cleaner) is prohibited. After shot blasting/grinding the surface, notify the engineer for inspection.
1. Prepare and clean substrate according to manufacturer's written instructions for substrate indicated. Provide clean, dry, neutral-pH substrate for underlayment application.
 2. Treat nonmoving substrate cracks to prevent cracks from telegraphing (reflecting) through underlayment. Rout any cracks and fill the cracks with the epoxy, scraping smooth and level with the substrate while broadcasting sand to allow for bonding of the SLU. After set, remove all loose sand.
 - a. Sikadur 52 epoxy by Sika
 - b. Sure-inject J-56 by Dayton Superior
 - c. Ardex ArdiSeal 2C Semi-Rigid Epoxy
 - d. CM-10 by CMP Specialty Products, Inc.
 - e. LATICRETE Drytek Epoxy Primer
 - f. LATICRETE SUPERCAP MVC
 3. Fill substrate voids, holes and patch the low spots with the following products to prevent underlayment from leaking:
 - a. Sika top 122 plus patching grout by Sika
 - b. Ardex SD-P by Ardex
 - c. HD-50 or Conspec Special Patch/Special Bond Acrylic by Dayton Superior
 - d. Fastcrete, Mascete, or Patchco by Silpro

- e. CMP RampStar
 - f. Mapei Mapecem Quickpatch
 - g. LATICRETE Drytek Patch
 - h. LATICRETE SUPERCAP Skimcoat
- B. **Soft/Weak Cementitious Substrates:** Mechanically remove laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond according to manufacturer's written instructions. Install strengthening membrane composed of primer, manufacturers mesh and cementitious material (repair mortar, underlayment) from 1/8" to 1/2" depending on material and manufacturer.
- C. **Nonporous Substrates:** For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond according to manufacturer's written instructions.
- D. **Adhesion Tests:** After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.
- E. Where substrate is uneven and use of rake alone will not result in a floor of the flatness and levelness specified, use LEVELPEG Elevation markings or similar item. Perform elevation survey using digital level device and mark floor topographical elevations in a 3' x 3' grid. Install self-adhering, cut-to-length, LEVELPEGS at grid marks to measurement. Install LEVELPEGS after moisture mitigation epoxy (if required) is dry and transparent. SLU is then to be poured to the top of each LEVELPEG as a visual depth guide to the SLU applicator.

3.5 APPLICATION

- A. **General:** Mix and apply underlayment components according to manufacturer's written instructions.
- 1. Coordinate application of components to provide optimum underlayment-to-substrate and intercoat adhesion.
 - 2. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
- B. **Mixing and installation of moisture mitigation membrane.** Choice of material must be based on compatibility to self-leveling material selected to provide the proper bond.
- 1. Mix material in accordance with manufacturer's instructions.
 - 2. Provide mix and applications to provide resistance up to 25 pounds per 1,000 square feet in 24 hours, including application of materials to provide bond to the SLU.
- C. **Mixing of SLU**
- 1. Provide water of exact quantity as required by manufacturer.
 - 2. Provide mechanical mixer for mixing SLU material with water at project site. Equip mixer with a suitable water-measuring device.

3. Use only mixers that are capable of mixing the dry SLU mix and water (and aggregate where required) into a uniform self-leveling mix.
- D. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- E. Installation
1. Apply self-leveling underlayment, in accordance with the manufacturer's instructions, to a minimum thickness of 1/8" over high points. Utilize a gage rake and/or self-adhering cut-to-length LEVELPEGs (spacing as required to meet finish) to provide a uniform average thickness and finish with a smoother to provide a level, smooth plane finish, free of score marks, grooves, depressions and ripples. Finish tolerance shall be as required for finish flooring:
 - a. Wood floors: Finish tolerance of $F_F=50$ and $F_L=35$, minimum.
 - b. All other finishes: Finish tolerance of $F_F=40$ and $F_L=25$, minimum.
 2. Where joints are required, construct to match and coincide with joints in base slab. Provide other joints as shown.
 3. Where depth of material will be over 3/4" deep (or less depending on manufacturer's printed literature for that product), place in two or more lifts by providing aggregate in the mix to extend the material of the first lift(s), followed by a finish pour of 1/4" without aggregate. The proportion of aggregate to SLU shall be as recommended by the manufacturer in writing. If acceptable and recommended in writing by the manufacturer, place uniform stone loose (after priming of substrate) and place self-leveling on stone. As an alternative, place non-extended mix in 3/4" maximum lifts (or less depending on manufacturer's recommendations for that product). Allow time between lifts as recommended by manufacturer to allow for curing and shrinkage. Prepare surface of each lift as recommended by manufacturer.
 4. Provide for transition between adjacent area not scheduled to receive underlayment.

3.6 PROTECTION

- A. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes. Protect all freshly deposited underlayment from premature drying and excessively hot or cold temperatures and maintain it with minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the underlayment.
- B. Protect underlayment against damage by covering with suitable protective materials such as kraft building paper, plywood, masonite or similar or in accordance with manufacturer's recommendations until installation of finish material.
- C. Protect underlayment from concentrated and rolling loads for remainder of construction period.

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- D. Do not walk on or install finish flooring over underlayment for a minimum of 24 hours after placement, or longer if required by the SLU manufacturer due to material type or environmental conditions.
- E. Do not install floor coverings for a minimum of 7 days.

3.7 FIELD QUALITY CONTROL

A. Field Samples

Periodically throughout placement as recommended by manufacturer, conduct "Patty" or "Flow Ring" test to confirm proper water/cement ratio. If requested, cast three brass-molded cubes in the presence of manufacturer's representative for compressive strength documentation.

B. Inspection

Notify the THE CITY OF NEW YORK of the beginning of each phase of work so the COMMISSIONER and other CITY OF NEW YORK Representatives can make inspections. Do not proceed with installation of materials until substrates have been prepared and approved by the COMMISSIONER and the manufacturer's representative. The CITY OF NEW YORK may also elect to engage a licensed laboratory to take samples of the material and witness the mixing.

C. Manufacturer's Field Service

Manufacturer's representative shall inspect and supervise substrate preparation and placement of the material. The manufacturer's representative is to inspect the substrate to ensure their material is appropriate for the application, that jobsite environmental conditions for placement are met, and to ensure the substrate preparation is adequate and shall provide a written report of such inspection.

3.8 ACCEPTANCE OF SELF-LEVELING UNDERLAYMENT WORK

A. General

1. Completed underlayment work that meets all applicable requirements will be accepted without qualification.
2. Completed underlayment work that fails to meet one or more requirements but which has been repaired to bring it into compliance will be accepted without qualification.
3. Failure of self-leveling underlayment to bond to substrate (as indicated by a hollow sound when tapped), or disintegration or other failure of underlayment to perform in accordance with product data, will be considered failure of materials and workmanship. Repair or replace underlayments in areas of such failures. Underlayment work judged inadequate or deemed unacceptable due to appearance shall be replaced if so directed by the Engineer at the Contractor's expense.
4. Pay all costs incurred by the CITY OF NEW YORK in providing additional testing and/or analysis required by this Section.

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5. The CITY OF NEW YORK will pay all costs of additional testing and analysis made at its own request that is not required by this Section or which shows concrete is in compliance with the Contract Documents.
- B. Dimensional Tolerances: Finished underlayment exceeding the tolerances may be repaired provided that strength, durability, or appearance is not adversely affected. High spots may be removed with a terrazzo grinder, low spots filled with a cement-based patching compound, or other remedial measures performed as permitted and as acceptable to the self-leveling underlayment manufacturer.

END OF SECTION

SECTION 04200
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 is not necessarily limited to the following:
1. Concrete block walls and partitions.
 2. Face brick and common brick.
 3. Glazed brick.
 4. Metal joint reinforcing, anchors, ties, weeps, flashing protection and related accessories for masonry.
 5. Control joints in masonry, filled with joint fillers.
 6. Embedded flashings.
 7. Chases, recesses, pockets and openings in masonry as required for installation of work.
 8. 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.
 9. Grouting in of metal items built into masonry work.
 10. Protection, pointing and cleaning of masonry.

1.3 SUBMITTALS

- A. Shop Drawings: Submit for:
1. Anchoring details.
 2. Control joint locations and details.
 3. Special brick shapes.
 4. Flashing at typical lintels indicating relationship of flashing to lintel hangers.
- B. Samples (Submit the following):
1. Each type of face brick in sufficient number and color to show full range of color and shade. Submit certification that brick meets ASTM standards specified.
 - a. Submit samples of all special shapes required showing color range and sizes.
 2. Concrete Block: Submit certification that block meets fire ratings and ASTM standards specified herein.
 3. Joint reinforcing, each type, width and proposed locations (labeled).
 4. Anchors, wedges and ties, each type; width and proposed locations (labeled).
 5. Joint filler, each type.
 6. Flashing, including splice sample, 12" x 12".

- C. **Manufacturer's Literature:** Submit technical and installation information for:
 - 1. Mortar materials, each material and mortar types.
 - 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 conducted by an Independent Testing laboratory retained by the CITY OF NEW YORK 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.

1.4 QUALITY ASSURANCE

- A. **Job Mock-Ups**
 - 1. Prior to installation of masonry work, erect sample wall panel mock-ups using materials, bonding patterns and joint tooling required for final work and including, cavity wall, masonry sill, anchors and reinforcement as detailed. Provide special features as directed by the COMMISSIONER for caulking and contiguous work. Building mock-up at the site, of size and location as shown on drawings and directed by the COMMISSIONER, indicating the proposed range of colors, textures and workmanship to be expected in the completed work. Re-construct mock-ups if directed by the COMMISSIONER until it meets with COMMISSIONER's approval. Obtain COMMISSIONER's acceptance of visual qualities of the mock-ups 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 COMMISSIONER. Use sample panels to test proposed cleaning procedures after sample panel meets with COMMISSIONER's approval.
- B. **Factory Control**
 - 1. The COMMISSIONER reserves the right to visit the brick manufacturer's facility and review pre-sorting so that all brick (both brick and accent color) fall within an acceptable color range.
 - 2. 4" x 4" mock-up shall be constructed at the factory using pre-sorted brick. This mock-up, after approval of the COMMISSIONER, shall become the quality control panel for the pre-sorting of brick at the factory.
 - 3. Prior to any shipment of the face brick from the factory, the COMMISSIONER reserves the right to inspect the brick for the thoroughness of the pre-sorting and to reject any brick which in his opinion do not fall within acceptable color range.
- C. **Work of this Section shall conform to the requirements of the following:**
 - 1. ACI 530/ASCE 5 Building Code Requirements for Masonry Structures.
 - 2. ACI 530-1/ASCE 6 Specifications for Masonry Structures.

1.5 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.

1.6 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.
 - 3. Fire rated masonry partitions shall have MEA or BSA number.
 - 4. Seismic connections and loads shall comply with Local Law 17-95 (NYC).

1.7 TESTING FOR EFFLORESCENCE

- A. Test selected face brick for efflorescence in accordance with ASTM C67.
- B. Test mortar proposed for use in face brick construction by casting into brick size using all ingredients and proportions; run test as described herein for face brick (ASTM C67).
- C. If, at the end of the test period, the samples of brick or mortar show efflorescence, the materials represented shall be rejected and new materials shall be re-tested until no efflorescence appears. Testing shall be done by an independent testing laboratory at the expense of the Contractor; submit test results in writing to the COMMISSIONER.

1.8 JOB CONDITIONS

- A. In cold weather, when the outside temperature is below forty (40) degrees F., the temperature of the masonry, when laid, shall be above forty (40) degrees F., and maintained on both sides of the masonry wall for at least seventy-two (72) hours. All water, sand and masonry units must be heated so that temperature of masonry when laid will be over forty (40) degrees F.. No anti-freeze admixtures will be allowed. Conform to the requirements of "Cold Weather Masonry Construction and Protection Recommendations: publication by Brick Institute of America (BIA).

PART 2 PRODUCTS

2.1 MATERIALS

A. Concrete Block

1. Portland cement, ASTM C150, Type 1, one source.
2. Aggregates, ASTM C331, 100% lightweight expanded shale, clay or slate aggregates, manufactured by the rotary kiln process equal to "Solite", Norlite" or Haydite" or approved equal.
3. Concrete Masonry Units: Load bearing 100% lightweight aggregate concrete masonry units conforming to the requirements of ASTM C-90, Grade N, Type 1 with a minimum compressive strength (fm) of 1900 psi.
 - a. Block behind face brick and block for rated walls shall be solid.
 - b. All other block shall be hollow, unless otherwise noted on drawings.
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" or 8" x 18" 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 block surfaces, 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 ninety (90) lbs. per cubic foot.
9. Shrinkage: Shrinkage of concrete blocks shall not exceed .065% when tested in accordance with ASTM C426.
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. Brick

1. Where brick is fully concealed provide common brick conforming to ASTM C62, Grade SW.
2. Brick Type "B" (Glazed Brick): Provide standard size glazed brick Color: BLACK. Glazing shall comply with ASTM C126, Grade S. (Unless Otherwise noted all exposed brick shall be this type)..
3. Brick Type "A": Face brick to match existing.

4. **Provide special molded shapes, where indicated and for application requiring brick of form, size and finish on exposed surfaces which cannot be produced from standard modular brick sizes by sawing.**

C. **Joint Reinforcing for Masonry Walls**

1. For anchoring face brick to CMU back-up, provide welded "ladder" design, of No. 9 gauge galvanized steel parallel side rods with adjustable anchors fastened to reinforcement 16" o.c. Provide special formed prefabricated pieces at corners and intersections of walls or partitions. Anchors to extend to within one (1) inch of face brick. Show anchor locations on approved shop drawings.

a. Joint reinforcing shall be Ladder Type.

b. At seismic conditions provide #280-S.I.S. Dub'l Loop-Lok ladder type reinforcement with Seismiclip, continuous 3/16" dia wire, 3/16" dia rectangular tie and Loop-Lok washer.

2. For interior block walls, provide "ladder" design without ties.
3. For reinforcement in exterior wall construction, finish shall be hot-dip galvanized conforming to ASTM A153, with zinc coating of 1.5 oz. of zinc per sq. ft. after fabrication.
4. For reinforcement in interior walls, finish shall be mill galvanized conforming to ASTM A641, Class 1 (0.40 oz./sq. ft.) after fabrication.
5. For anchoring masonry to structural steel provide hot-dip galvanized steel anchors. 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.

6. For anchoring CMU interior partitions to underside of steel beams, provide hot-dip galvanized steel tube anchors.
7. For anchoring CMU wall, at the exterior masonry cavity wall, to the underside of the structural slab provide 14 ga. hot-dip galvanized steel channels.

a. Provide "Corrugated Gripstay Anchor" fabricated of 14 ga. hot-dip galvanized steel, 7" long,

8. **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. **Dovetail Anchors:** Galvanized steel, sixteen (16) gauge by one (1) inch wide, crimped or corrugated, by length to suit condition, to fit dovetail slots.
2. **Flat Metal Ties:** Galvanized steel, eighteen (18) gauge by 7/8" wide, crimped or corrugated, by length to suit condition. Where dovetail anchors have not been set in

concrete, anchor metal ties to concrete using expansion bolts or power actuated fasteners meeting with COMMISSIONER's approval.

3. Wire Mesh: Galvanized sixteen (16) gauge steel wire, 1/4" square mesh, width 1/2" less than wall thickness, by length to suit condition.
 4. Approved Manufacturers: Heckmann Building Products, Hohmann & Barnard, Inc., National Wire Products Industries, Inc., Dur-O-Wall or approved equal.
- E. Reinforcing Bars and Rods: ASTM A615, Grade 60. See Structural Drawings for size.
- F. Control Joint Filler
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 07900 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. Recess joint filler and install backer rod and sealant as per drawings and Section 07900 of these specifications.
 3. Within Face Brick: Provide Expanding Foam Sealant installed to twenty-five (25) percent compression behind filler rod and sealant installed by Section 07900. Filler depth shall be 2 x joint width. Note: If metal surfaces, or in contact with caulk, use Foam Sealant specifically designated for this application.
 - a. Compressible filler between top of brick and bottom of shelf angle shall be Sof Joint type filler.
- G. Embedded Flashing: Factory manufactured consisting of 40 mil, EPDM flashing.
- H. Insulation: As specified under Section 07210.

2.2 MORTAR MATERIALS

- A. Portland Cement: ASTM C150, Type 1, standard color, one source.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Sand: Clean, washed, buff colored sand, graded per ASTM C144.
- D. Water: Clean, fresh and suitable for drinking.
- E. Masonry Cement (for interior block partitions only): ASTM C91.
- F. Latex Additives: For mortar mix at brick sills, provide Laticrete 4237 made by the Laticrete Corp., Elastiment 753 made by Boiardi Products Corp, Latex Additive by Mapei or approved equal.
- G. Provide Dry-Block type waterproof additive in all exterior mortar for ground face CMU.

2.3 MORTAR MIX

- A. Exterior Glazed Brick Construction: Mortar mixes shall meet design strengths of ASTM C270, Type N, cement/lime mortar. Colors of mortars shall use coloring agent to match Davis Colors Graphite #8084.
- B. Exterior Face Brick Construction: Mortar mixes shall meet design strengths of ASTM C270, Type N, cement/lime mortar. Colors of mortars shall use coloring agent to match existing mortar.
- C. Exterior Block Back-Up Construction: Provide mortar conforming to ASTM C270, Type S, with not more than 1/2 part lime per part of Portland cement.
- D. Interior Masonry Construction: Provide mortar conforming to ASTM C270, Type N.
 - 1. Ground face block mortar to be selected by COMMISSIONER and approved with test panel sample.
- E. Mortar for Cement Cants: One (1) part Portland cement and four (4) parts sand, by volume.
- F. 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.
- G. 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. Mortar may be re-tempered only to replace water lost by evaporation which shall be done within one (1) hour after initial mixing. 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 C91.
- H. 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" diameter by four (4) inches long with removable rope inserts equal to No. 341 made by Hohmann & Barnard *or approved equal corresponding to the performance characteristics of the product indicated.*

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2.5 FLASHING PROTECTION

- A. Provide 10" high HDPE "Mortar Net" open mesh mortar of width to fit masonry cavity shown on drawings, manufactured by Hohmann & Barnard *or approved equal corresponding to the performance characteristics of the product indicated.*

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 COMMISSIONER.

B. Discrepancies

1. In the event of discrepancy, immediately notify the COMMISSIONER.
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.
- B. Carefully remove existing brick. Brick deemed by the COMMISSIONER to be acceptable shall be reused.

3.3 PREPARATION

A. Brick

1. Wet brick having ASTM C67 absorption rates greater than 0.025 oz. per square inch per minute.
2. Determine absorption by placing twenty (20) drops of water inside a circle the size of a quarter on typical units. If water is absorbed within 1-1/2 minutes, wet brick before laying.
3. Use setting methods which ensure that each masonry unit is nearly saturated but surface dry when laid. During freezing weather, comply with the recommendations of BIA.
4. Except for absorbent units specified to be wetted, lay masonry units dry.

- B. Concrete Block: Do not wet concrete block units.

3.4 INSTALLATION

A. General

1. 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.

2. Build chases and recesses as shown or required for the work of other trades.
3. 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.
4. 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.
5. Lay up walls plumb and true with courses level, accurately spaced and coordinated with other work.
6. Provide templates made of steel studs for plumbing of two story masonry openings.
7. Pattern Bond: Lay exposed masonry patterns as noted on drawings. If not shown, provide running bond. Lay concealed concrete block with all units in a wythe bonded by lapping not less than two (2) inches. Bond and interlock each course of each wythe at corners. Do not use units of less than four (4) inches horizontal face dimensions at corners or jambs.
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 COMMISSIONER.

B. Mortar Bedding and Jointing

1. All joints between bricks shall be completely filled with mortar. Bed joints shall be formed of a thick layer of smooth or slightly furrowed mortar applied to the units previously laid, with the brick then shoved in place; or bed joints may be formed as specified for cross joints. Cross joints shall be formed by applying a full coat of mortar to the entire end of the entire side, as the case requires, and then shoving the mortar covered end and/or side of the brick tightly against the bricks previously laid; the practice of buttering the corners of brick and then throwing mortar scrapings into the empty joints will not be permitted. All brick shall be laid without disturbing the brick previously laid. Dry or butt joints will not be permitted. Grouting shall be done only as necessary. Do not slush head joints.
2. Lay concrete masonry units with full mortar coverage on horizontal and vertical face shells and cross webs. Bed webs in mortar in starting course on exterior walls, footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
 - a. To ensure alignment of brick and block coursing, adjust block back-up by cutting block to insure alignment of coursing or use adjustable anchorage.
3. Lay masonry walls with 3/8" joints unless otherwise shown on drawings.
4. Lay solid brick-size masonry with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not furrow bed joints or slush head joints.
5. At cavity walls, slope beds toward cavity to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against cavity face of brick.
6. Tool exposed joints slightly concave. Concealed joints shall be struck flush.

7. 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 brick 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. Grout in door frames, access doors, louvers and other metal items embedded or built into masonry work solidly with grout.
 3. Grout under lintels, bearing plates, and steel bearing on masonry with solid bed or mortar.
 4. Grout around sleeves, pipes, ducts and all other items which pass through masonry walls solidly with mortar, so as to be air tight and prevent air leakage. Refer to Section 07270 for packing of voids in rated masonry walls.
 5. Fill vertical cells of masonry units solid with mortar or grout which have anchoring, reinforcing rods, supporting or hanging devices embedded in the cell including stone anchors and 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 mortar 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 truss 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 face brick construction without COMMISSIONER'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 required patching in exposed work, if approved by COMMISSIONER, shall be patched neatly with mortar to match appearance of masonry as closely as possible and to the COMMISSIONER'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. Cavity Walls

1. All exterior masonry walls, unless otherwise indicated, shall be cavity walls of thickness indicated.
2. Two wythes of masonry cavity walls shall be securely tied together by horizontal joint reinforcement and ties anchored to reinforcement, as herein specified, spaced every other block course.
 - a. Where cavity back-up is concrete use ties specified herein spaced sixteen (16) inches o.c. both direction.
3. Cavity between facing and backing wythe shall be kept clean and clear of all mortar droppings, and no mortar ledges shall project into the cavity. Temporary wood strips, cut to width of cavity and fitted with lift-up wires, shall be laid on the joint reinforcement and carefully lifted out before placement of the next layer of reinforcement. Any projecting mortar shall be spread over the back of the outer wythe immediately following the setting of the masonry unit. Fill base of cavity walls with 3/8" pea gravel as detailed.
4. Weep holes shall be 3/8" O.D. PVC tubing with rope inserts set in staggered pattern of two levels as shown on drawings. Provide weep joints above through wall flashing as it extends out, along bottom of cavity walls, bond beams, shelf angles and other water stops. Leave rope inserts in place, continue up vertically through pea gravel and tie to metal ties in cavity.
5. At cavity and solid walls adjacent to window openings fill block solid with mortar where window anchors are to be located. Coordinate with window subcontractor.
6. Concrete block back-up at cavity wall construction shall have a one (1) inch "soft" joint at top of partition consisting of fire stop sealant conforming to the requirements of Section 07270. Wall shall be anchored to slab at top with dovetail anchors spaced sixteen (16) inches o.c.

H. Interior Block Partitions

1. Build full height to underside of structure above. At non-rated partitions fill void with continuous neoprene filler conforming to the requirements of Section 07910. At fire rated partitions, fill void with fire stop material meeting the requirements of Section 07270. Brace partitions with steel angles conforming to ASTM A36, shop primed, size as detailed on drawings. Securely anchor angles to slab.
2. Provide continuous horizontal joint reinforcing every other block course. 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 and bend units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

4. At interior partitions reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcing placed in two (2) horizontal joints approximately eight (8) inches apart, immediately above the lintel and immediately below the sill. Extend reinforcing a minimum of 2'-0" beyond jambs of the opening, bridging control joints where provided.
5. Corners
 - a. Provide interlocking masonry unit bond in each course at corners and as shown on the drawings.
 - b. Provide continuity at corners with prefabricated "L" reinforcement units, in addition to masonry bonding.
6. 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.
- I. Ties and Anchors for Masonry Construction
 1. Provide ties and anchors as shown or required, but not less than one metal tie, spaced not to exceed sixteen (16) inches o.c. horizontally and vertically. Stagger ties in alternate courses. 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. For anchoring masonry to lightgauge metal framing provide stainless steel screw anchors penetrating through studs; space anchors 8" o.c. maximum.
- J. 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. Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 25'-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 more than 6'-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.
- K. Lintels
 1. Install loose steel lintels furnished by Section 05500, allowing eight (8) inch bearing at ends.

L. Flashing

1. Provide concealed flashings in masonry work as shown. Prepare masonry surfaces smooth and free from projections. Seal flashing penetrations with adhesive before covering with mortar. Terminate flashing beyond the face of the wall and cut back flush to the face.
2. 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 brick, up and over the top of the concrete masonry unit construction of the inner wythe, as detailed on drawings. At concrete spandrel beams and columns the flashing shall be installed with a continuous pressure bar. Flashing shall be loosely draped. 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 CITY OF NEW YORK. All flashing shall be continuous around building unless otherwise noted on the drawings. Turn flashing up at back of concrete block in masonry cavity as detailed and adhere to block. Provide flashing of sufficient width to allow flashing to protrude 1-1/2" beyond building face. Trim excess only at time of final brick clean down.
3. Where flashing is penetrated by anchors, patch flashings at penetration using adhesive and mastic recommended by the manufacturer to insure watertight seal.
4. Install flashing in accordance with manufacturer's instructions, using adhesive, primer, thinner, cleaner and mastic as recommended by flashing manufacturer.
5. Provide weep holes of type specified in the head joints of the first course of masonry immediately on concealed flashings. Space twenty-four (24) inches o.c.
6. Provide flashing protection in cavity at weeps as shown on the drawings.

3.5 CLEANING, PROTECTION, ADJUSTMENT

A. Clean-Up

1. Upon completion, all exposed masonry shall be thoroughly cleaned. Before applying any cleaning agent to the entire wall, it shall be applied to a sample wall area of approximately twenty (20) square feet in a location approved by the COMMISSIONER. No further cleaning work may proceed until the sample area has been approved by the COMMISSIONER, 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 wetted with clear water and then scrubbed with a solution of an approved detergent masonry cleaner, 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, against mortar spatter, and shall immediately remove any such spatter should it inadvertently occur, leaving no stain or discoloration.
2. Trim exposed flashing.

B. Protection

1. Excess mortar shall be wiped off the masonry surfaces as the work progresses.
2. Wood coverings shall be placed over all such masonry surfaces as are likely to be damaged during the progress of the entire project.
3. Protective measures shall be performed in a manner satisfactory to the COMMISSIONER.
4. Damaged masonry units shall be replaced to satisfaction of the COMMISSIONER.

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5. Exterior masonry walls shall be draped with waterproof covering until copings are in place, to prevent water penetration in cavity.
- C. Pointing: Point any defective joint with mortar identical with that specified for that joint.

END OF SECTION

SECTION 04510
MASONRY CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide all masonry cleaning Work as indicated on the Drawings and as specified herein, including, but not limited to the following:

1. Brick

1.2 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. American Society for Testing and Materials (ASTM)

1.3 SUBMITTALS

A. Product Data:

Cleaning materials manufacturers' catalog sheets, specifications, and application instructions.

B. Quality Control Submittals:

1. Cleaning Subcontractor's Qualifications Data:

- a. Firm name, address, and telephone number.
- b. Period of time firm has performed masonry cleaning work, and names and addresses of the required number of similar projects completed by the firm.

2. Cleaning Procedure: Proposed cleaning procedure for cleaning masonry including each step in the cleaning process, type of scaffolding, and type, size and location of equipment.

C. Submit a description of Protection Procedures for each condition and surface which requires protection.

1.4 QUALITY ASSURANCE

A. Cleaning Contractor's Qualifications: The firm performing the Work of this Section shall have been regularly engaged in masonry cleaning work for three years using the cleaning method specified.

B. Field Examples:

1. Before the building cleaning operations are started, clean a sample panel of approximately 100 square feet of each type of masonry required to be cleaned at a location on the building directed by the COMMISSIONER. If the sample panel is not satisfactory, as determined by the COMMISSIONER modify the cleaning procedure and clean another sample panel. Continue cleaning sample panels until satisfactory results are obtained and approved by COMMISSIONER. When a final approval is obtained, go back and re-clean all previously rejected panels.

- a. For cleaning procedures other than specified, but which generally follow the method(s) specified, submit proposed procedure for approval and clean additional sample panels adjacent to the above sample panels for comparison of results.
 - 2. Approved panels and procedures will become the cleaning standard for the Work of this Section.
 - 3. Cover the approved sample panels with six mil polyethylene plastic mounted on wood frames of adequate size and strength to protect the panels until the completion of Work. The cover shall be easily removable for comparison with completed Work.
- C. If unusual types of soiling agents are encountered, consult with COMMISSIONER before proceeding with the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cleaning materials in manufacturer's packaging, with instructions for use.
- B. Store, protect, and handle cleaning materials in accordance with manufacturer's instructions.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Make necessary provisions for the diversion and disposal of cleaning water and solutions, including the furnishing of pumps if required. Take precautions as required to prevent damage and contamination resulting from run off of cleaning solution.
 - 2. Do not wet or wash down masonry surfaces when the temperature is below 40°F or may drop below 40°F within 24 hours.
- B. Existing Conditions:
 - 1. Take necessary precautions and protective measures to prevent injury to people and damage to property in areas adjacent to the Site, including damage due to wind drift of cleaning materials.
 - 2. Pumping equipment will not be allowed in or on the building.
 - 3. Ensure that painted surfaces (such as exterior doors, windows, window sills, etc.) are not affected by the washing, except for those surfaces designated by the COMMISSIONER for cleaning.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Materials: Liquid detergents and water, and solutions of chemical cleaning agents and additives, that will remove the dirt, grime, carbon, surface residues, stains, and other foreign material from the masonry surfaces, but will not damage the masonry.
- B. Do not use abrasive blasting aggregate cleaning method, or low pressure micro-abrasive powder process or any other cleaning method until written permission is given by the CITY OF NEW YORK.

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PART 3 - EXECUTION

3.1 PREPARATION

A. Protection:

1. Protect windows, doors, fixtures, air conditioners, roofing, flashings, painted surfaces and other adjacent surfaces not required to be cleaned, from damage.
2. Protect landscaping, paving, and other improvements near the building from damage.
3. Construct temporary sidewalk sheds at building entrances and other areas to divert cleaning materials and debris away from entrance ways and to provide sheltered access to the building.

B. Surface Preparation:

1. Remove vines, bird nests, stalactite deposits, and heavy accumulations of dirt, bird droppings and other foreign materials from surfaces required to be cleaned. Remove material from the site.
2. Perform this preliminary cleaning by brushing, sweeping, wiping, scraping, vacuuming, and other approved methods as required by existing conditions. Use tools that will not damage the masonry.

3.2 CLEANING MASONRY

A. Chemical Solutions or Liquid Detergent and Water:

1. Prewet the masonry surfaces with water.
2. Prepare cleaning solutions and operate pressure spray equipment in accordance with cleaning materials manufacturer's recommendations, unless otherwise indicated.
 - a. Clean areas not accessible to spray equipment with bristle brushes.

B. Water Cleaning Methods:

1. Low pressure (water soak) for limestone and marble.
2. Medium pressure: Use 200 psi to 600 psi.

C. Clean masonry equal in appearance to the approved sample panels.

D. Clean masonry free of dirt, grime, soot, carbon, efflorescence, moss, stains, , tendrils, and other foreign materials. Leave masonry uniformly clean and undamaged.

E. Clean all features and appurtenances of the masonry such as sills, arches, lintels, returns, reveals, projecting courses, coping, entablature work, back of parapets and balustrades, balconies, friezes, fascias, cornices, chimneys and other features, except for those building features which are painted and are not included in the scope of work.

F. Thoroughly rinse off the masonry surfaces with water.

3.3 CLEAN-UP

- A. Clean and restore sidewalks, paving, and lawns soiled or damaged as a result of the cleaning operations. Remove all protective materials.

END OF SECTION

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SECTION 04515
MASONRY RESTORATION AND TUCK POINTING

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. The work of this section (except for removal of masonry) shall not take place until all paint, flashing or other coatings designated by the COMMISSIONER has been removed.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor materials, equipment and services necessary to complete the tile as shown on the drawings and/or specified herein, including, but not limited to, the following:
1. Stripping, Cleaning and Tuck pointing of masonry on Utica Avenue side of building [including street front façade, set back façade parapets and façade masonry that returns around building sides], entire roof side parapet and other areas as shown on the drawings.

1.3 REFERENCES

References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- A. American Society for Testing and Materials (ASTM)
- A240 Standard Specification for Heat-Resisting Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
 - A580 Standard Specification for Stainless and Heat-Resisting Steel Wire.
 - C67 Standard Methods of Sampling and Testing Brick and Structural Clay Tile.
 - C109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-inch or 50 MM Cube Specimens).
 - C126 Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
 - C144 Standard Specification for Aggregate for Masonry Mortar.
 - C150 Standard Specification for Portland Cement.

- C207 Standard Specification for Hydrated Lime for Masonry Purposes.
- C270 Standard Specification for Mortar for Unit Masonry.
- C404 Standard Specification for Aggregates for Masonry Grout.
- C476 Standard Specification for Grout for *Reinforced* and Nonreinforced Masonry.

- C780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.

- C979 Standard Specification for Pigments for Integrally Colored Concrete.

B. Brick Industry of America (BIA): BIA Technical Notes

1.4 QUALITY ASSURANCE

A. Qualifications

1. Company specializing in the Work of this Section shall have a minimum of three years experience with similar quantity of materials.

B. Regulatory Requirements

Building Code: Work of this Section shall conform to all requirements of the NYC Building Code and all applicable regulations of governmental authorities having jurisdiction, including safety, health, noise, and anti-pollution regulations. Where more severe requirements than those contained in the Building Code are given in this Section, the requirements of this Section shall govern.

C. Certification: Masonry construction shall conform to the material acceptance, certification and inspection requirements of Section BC 1701 of the 2014 NYC Building Code.

D. Mock-ups

1. Prior to performing the Work of this Section, prepare at the job site sample panels of not less than 12 sq ft for each type of masonry restoration Work required, including cutting of joints prior to and after pointing. Sample panels shall be at locations indicated on the Drawings or where directed by the COMMISSIONER. Inconspicuous locations will be chosen, except where it is necessary to choose other locations to be representative of brick color, joint size, mortar color, and other aspects of masonry appearance.
2. Clean masonry and mortar of the mock-up area and surrounding area to expose the true color of the masonry prior to preparing sample panels. Cleaning materials shall not damage masonry surface. Do not proceed further with the Work until the sample panel has been approved by the COMMISSIONER.

Approved samples will be used as quality standards for the Work. Maintain approved samples at the Site until the Work is completed. Once the panel is approved, do not change materials or proportions of mortar mixes unless approved by the COMMISSIONER. Sample panels may be a portion of existing masonry that is to be restored, at a location directed by the COMMISSIONER.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaged Products

1. Deliver materials to the site in manufacturer's original, sealed containers. Do not deliver materials that have exceeded shelf life limitation set forth by the manufacturer. Material containers shall bear the manufacturer's label indicating manufacturer's name, trade name of product, lot number, shelf life of product, and mix ratio (if applicable). This includes individual bags of pre-bagged mortar mixes.
2. Comply with manufacturer's printed instructions for storing and protecting materials.

- B. Bulk Aggregate: Store in a manner which will keep aggregate clean and protected from the weather elements.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Reinforcement and Ties

1. Hohmann & Barnard, Inc., Hauppauge, N.Y.
2. Dur-O-Wall, Arlington Heights, IL.
3. Helifix North America Corporation
4. Blok-Lok Ltd.

B. Mortar Coloring

1. "SGS" Mortar Colors, Solomon Grind-Chem Services, Inc.
2. "True Tone Mortar Colors", Davis Colors, Rockwood Industries, Inc.
3. "Flamingo Colors ", The Riverton Corporation.

C. Masonry Cleaner

- 1. ProSoCo, Inc., South Plainfield, N.J.
- 2. Sure-Kleen

D. Restoration Mortar

- 1. Cathedral Stone Products
- 2. Edison Coatings, Inc.

2.2 REPLACEMENT FACE BRICK MANUFACTURERS/DISTRIBUTORS

- A. Stone Art Inc., 295B California Ave. Church Hill, TN

2.3 MATERIALS

A. Base Materials

- 1. Portland Cement: Type I ASTM C150
- 2. Sand for Mortar Mix ASTM C144
Sand shall be natural sand
matching the gradation and color
of the existing mortar aggregate.
- 3. Hydrated Lime ASTM C207
Type "S"
- 4. Water: Shall be clean potable water free of injurious foreign matter conforming to the requirements of Section BC 1903.4.
- 5. Mortar Coloring: Provide pure mineral pigments, natural and synthetic iron oxides, and chromium oxides compounded for use in mortar mixes. Material shall conform to ASTM C979. Coloring shall not contain alkalyde salts. No liquid colorants shall be permitted.
- 6. Premixed sand and lime for mortar mixes is not permitted. The use of batched material by Spec-Mix and factory-packaged cement-lime-pigment by major mortar manufacturers is permitted. Each individual bag of material shall have the manufacturer's label identifying the mortar type.

7. No air-entraining admixtures or material containing such shall be permitted in the mortar. Also, no anti-freeze compounds, calcium chloride, or other compounds, unless expressly permitted otherwise, shall be permitted in the mortar.

B. Masonry Units

1. Match existing units in type, grade, size, appearance, texture, and color unless otherwise indicated. Provide multiple types, sizes, and colors of brick to match existing brick patterns.
2. In addition to 1. above, brick shall be clay or shale, ASTM C216, grade SW, solid. Brick shall be tested for efflorescence in accordance with ASTM Test Methods C67 and the rating shall be "Not Effloresced".
3. Lip brick are to be factory manufactured only. Do not use field cut lip brick.
4. Use 100% solid brick over exterior relieving angles/lintels or other brick projections on exterior face of building. (Use of solid brick with cores is acceptable if cores are filled solid with mortar and the cores are not visible to view.)

C. Accessories:

1. Material

a. Reinforcement and anchors

- 1) Stainless Steel: 18-8, type 304
- 2) Sheet Steel: (No. 2B finish), cold-rolled, annealed, ASTM A240.
- 3) Wire Steel: ASTM A580

b. Manufactured Units: All manufactured units shall be as follows:

- 1) LOX-ALL #120 Truss-Mesh, 9 gage, of proper width for the wall thickness.
- 2) Veneer Anchor: DW-10HS Manufacturers Hohmann & Barnard or approved equal. Stainless steel Type 304, ASTM A580.
- 3) Vee Tie: Stainless steel, masonry wire ties. Manufacturer - Hohmann & Barnard or approved equal.
- 4) Anchors: Manufacturers - Rawlplug; RKL. 1/4" diameter, 2" long flat head stainless steel Zamac Nailing Fastener by Rawlplug Company Inc. of approved equal.

- 5) Wire: Stainless steel continuous wire by Hohmann & Barnard or approved equal.
 - 6) If the actual space between wythes of solid masonry limits the use of a particular anchor, notify the Engineer of Record for an acceptable alternate anchor.
 - 7) Seismicclips: #187 by Hohmann & Barnard or approved equal.
- c. Mortar mesh: "Mortar Net" high density polyethylene or nylon, full width of cavity, with stepped top to catch mortar droppings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine all adjoining Work on which this Work is in anyway dependent for proper installation and workmanship. Report to the COMMISSIONER any conditions that prevent the performance of this Work.

3.2 PREPARATION AND PROTECTION

A. Protection

1. Protect adjacent surfaces not being restored. Protect sills, ledges, and projections from material droppings. Also protect any painted surfaces that are not included in the Work from impact or damage.
2. Cover top of masonry wall with waterproof plastic membrane at the end of the work period and at other times when Work needs to be protected from rain and other precipitation. Extend cover down sides as needed to thoroughly protect the Work.
3. During cold weather, do not use wet masonry units and frozen masonry units.
4. Do not use frozen materials or lay masonry on frozen materials; remove frozen materials from wall. Refer to Part 1 of this Section, "Environmental Requirements" for temperature restrictions.
5. Remove excess mortar from walls as soon after laying units as practicable to prevent staining and to facilitate cleaning of wall.
6. Brace walls as needed until sufficiently set, or until intersecting walls provide lateral support.

7. Scaffolding shall not be supported from a parapet wall on which work is being performed.
8. Work on the exterior face of a parapet wall shall not be done concurrently with work on the interior face of the parapet wall.

B. Surface Preparation

1. Prepare surfaces to be restored in compliance with product manufacturer's printed instructions and as specified.
2. Remove dirt, dust, and foreign material from surfaces to be restored.
3. Clean areas to be restored with compressed air or water flushing, except as otherwise recommended by the mortar manufacturer.

C. Material Preparation

1. Do not further wet concrete masonry units and stone that are already wet.
2. Wet bricks that have a high initial absorption rate (greater than 20 g/min). Wet bricks until water runs off. Install bricks when surface is slightly damp.
3. Prepare exposed mortar to match the color and appearance of existing adjoining mortar.

3.3 REPOINTING JOINTS

- A. The Contractor shall take all precautions required to ensure the original appearance of the building is maintained (not changed) and the existing brick is not damaged. The new mortar shall match the original in color & texture and the new joint shall match the existing joint tooling, size and profile. For joints that are set back from the brick face (raked joints), provide a sloping joint starting at the original depth at the top and sloping to the brick face at the bottom that will prevent water sitting on the brick while maintaining the intended shadow line.
- B. Rake or cut out joints to a minimum uniform depth of 3/4" and until sound surface is reached. Do not spall edges of masonry units or widen joints. Replace all brick damaged by such operations with new to match color, size, and texture.

1. Mortar Removal

Where cutting is required to remove existing mortar and joint filler, use a rotary power masonry saw wherever possible without damaging masonry. Masonry saw shall have a vacuum attachment to reduce dust. Use non-power tools for vertical brick joints or where rotary power masonry saw will damage joint.

2. Cut the mortar and joint filler cleanly from the sides of the joints, leaving square corners. Flush joints clean with water or compressed air.
- C. Dampen joints slightly before application of mortar, making sure there is no free water. Pack pointing mortar tightly in joints in thin layers (1/4" max.), with each layer "thumbprint hard" before applying the next layer. Tool joints to match existing adjoining joints.
1. Where joint sealant is required, backpack the joints tightly out to a uniform depth of 1/4", or as indicated on Drawings. Refer to Section 07900 for sealants. Apply bondbreaker tape prior to installing sealants.
- D. Cure mortar by maintaining in a damp condition for at least 72 hours.

3.4 REPLACING MASONRY UNITS

- A. The Contractor is responsible for performing Work in a safe manner. Provide temporary shoring or other supports as required to prevent displacement of existing masonry that is to remain. Perform the removal Work with such care as may be required to prevent failure of the masonry or damage to adjoining masonry that is to remain. Follow method of operation and/or bracing scheme required to be provided in Article 1.04 titled "Submittals".
- B. Remove the deteriorated and damaged masonry units to their full depth, including the surrounding joint mortar. Wet masonry to reduce dust. Install helical masonry ties at perimeter of replacement prior to removal as indicated in details on the Drawings. Wherever possible without damaging masonry, use a rotary power masonry saw for cutting Work. Masonry saw shall have a vacuum attachment to reduce dust. For SHPO designated/landmark buildings, removal of perimeter brick in the area designated for removal shall be done by first cutting the joint utilizing methods specified in Art. 3.04,B.,2. Leave square corners at adjoining masonry that is to remain. Clean joints and cavities by flushing with water or compressed air.
- C. Dampen contact surfaces slightly before application of mortar, making sure there is no free water. Install matching masonry units with Type N mortar. Install units to match and align with existing masonry. Maintain bonding and coursing pattern of existing masonry. Use presoaked wood wedges where necessary to properly set the units and maintain uniform matching joints. Backpack and fill joints full of mortar. Finish joints to match existing adjoining joints as described in Art. 3.04- Repointing Joints. Fill open joints in backup. In solid masonry construction, ensure that entire collar joint is filled between the backup and the face masonry. Collar joint is likely to vary substantially, up to 3" in locations.
- D. Install accessories as indicated on Drawings. In cavity wall construction provide mortar mesh directly on flashing, such as at base of wall, and at relieving angles and lintels, with flashing extending at least 6" above top of mortar mesh.

E. Area Face Brick Replacement

1. Single wythes of brick shall be replaced in 4 foot lengths .
2. Install reinforcement every 16" each way and secure it to backup masonry as indicated on Drawings.

F. Replacement by Brick Stitching

Remove and replace existing brick to their full depth with new face brick, one brick each on both sides of crack in masonry. Also, remove and replace all existing pushed-out, missing, split or otherwise defective face bricks to match the adjoining existing good sound masonry. If the existing masonry work has a solid masonry common-bond pattern, existing sound header bricks shall remain. However, any cracked, defective or loose header brick shall be replaced. All new brick work shall be toothed into existing good work. At horizontal and diagonal cracks, the replacement of bricks shall be done in 4-foot lengths. Existing mortar bed for replaced brick shall be thoroughly removed and the back parged with a coat of new mortar to fill the collar joint.

3.5 PROTECTION AND CLEANING

- A. Protect face of adjacent walls and surfaces from water, mortar, and grout used for terra cotta installation.
- B. Remove excess mortar and mortar smears as work progresses.
- C. After mortar has cured (a minimum of 30 days), clean soiled surfaces with detergent and clean water. Use fiber brushes and cloths. Do not use metallic tools or acids. Perform a mock-up of the cleaning procedure.

END OF SECTION

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SECTION 05500
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. Furniture grade aluminum work and fasteners.
 2. Rough hardware.
 3. Loose steel lintels.
 4. Light steel framing and supports, not included as part of work of other trades.
 5. Masonry support steel.
 6. Sleeves in concrete walls and slabs.
 7. 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.
 8. Prime painting, touch-up painting, galvanizing and separation of dissimilar metals for work of this Section.
 9. 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 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.

1.4 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.
- C. **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.
- D. **Aluminum Samples:**
 - a) **Provide 8" x 8" AAM31, AAM32,, AAM33, AAM34 and AAM35 Directional textured finish samples without coating and sealed with clear, hard-coat wax and buff complying with AA-M20 (per NAAMM/National Association of Architectural Metal Manufacturers).**
 - b) **Based on COMMISSIONER'S approval of sample furnished in accordance with a) above, provide fully finished 12" x 12", aluminum plate with two countersunk screw holes and screws; Provide 12" length of all extruded aluminum, fully finished. Samples shall be the basis for all interior aluminum finish work.**

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 A36.
- 3. **Steel Tubing:** Cold formed, ASTM A500; or hot rolled, ASTM A501.
- 4. **Structural Steel Sheet:** Hot rolled, ASTM A570; or cold rolled, ASTM A611, Class 1; of grade required for design loading.
- 5. **Galvanized Structural Steel Sheet:** ASTM A446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.
- 6. **Steel Pipe:** ASTM A53, 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 A48, Class 30, unless another class is indicated or required by structural loads.
- 8. **Malleable Iron Castings:** ASTM A47, 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 A47, or cast steel, ASTM A27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A153.
11. Stainless Steel: ASTM A666, Type 304, stretcher leveled, No. 4 finish.
12. **Aluminum: ASTM B209-14, unless otherwise noted, 1/2" thick x 4' x 10' plate,**

B. Grout: Non-shrink, non-metallic grout.

C. Fasteners: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.

1. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A.
2. Anchor Bolts: ASTM F1554, Grade 36.
3. Lag Bolts: ASME B18.2.1.
4. Machine Screws: ASME B18.6.3.
5. Exposed Screws (for aluminum plate): Square, Allen or Torx drive, #9 (or as established in shop drawing preparation and review) flat head wood (or as required for substrate), zinc or stainless steel screws; length as required for application.
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.

D. Bituminous Paint: Cold applied asphalt emulsion complying with ASTM D1187.

E. Galvanize Repair Coating: For touching up galvanized surfaces after erection, provide Cold Galvanizing Compound.

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.
- B. Cleaning: Thoroughly clean metal surfaces of all mill scale, rust, dirt, grease, oil, moisture and other contaminants prior to galvanizing.
- C. Application: Hot-dip galvanizing shall be applied in accordance with:
 - 1. ASTM A123: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 2. ASTM A153: Galvanized Coating on Iron and Steel Hardware - Table 1.
 - 3. ASTM A446: Galvanized Coating on Steel Sheets.
 - 4. Minimum weight of galvanized coating shall be two (2) oz. per square foot of surface.
- D. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- E. 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.
- F. 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.
- G. After galvanizing all materials not exposed to view must be chromated by dipping material in a 0.2% chromic acid solution.
- H. 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 COMMISSIONER.

2.4 PROTECTIVE COATINGS

- A. Whenever dissimilar metals will be in contact, separate contact surfaces, drilled holes and any other contact with inert membranes, coatings or bituminous paint which shall be in addition to the specified shop prime paint. Coat each contact surface prior to assembly or installation and 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 assembled work in largest practical sizes to minimize field work. It is the responsibility of the contractor 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 (Except Aluminum): 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 COMMISSIONER.
 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, butts, 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.

2.7 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. 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.

C. 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.
- D. 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. Steel Gratings and Frames
- E. Masonry Support Steel
1. Provide galvanized steel, relieving angles, plates, accessories and other steel shapes for masonry support steel; for lintels refer to Para. B. 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.
- F. 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.
- G. Stainless Steel
1. Stainless Steel Sheet, Strip, Plate, and Flat Bar: ASTM A 666, Type 304, stretcher leveled, and No. 4 finish.
 2. Stainless Steel Tube: ASTM A 554, Grande MT-304, and No. 4 finish.
 3. Apply sound dampening to underside of metal work surfaces, including sinks and similar units. Provide coating with smooth surface and hold coating 1" back from open edges for cleaning.
 4. Fabricate assembly in accordance with NSF 2 "Food zone" requirements. All welding shall be accomplished using welding rod of same composition of metal being welded. Use methods that minimize distortion and develop strength and corrosion resistance of base metal. Provide ductile welds free of mechanical imperfections such as gas holes, pits or cracks.
- H. Aluminum
1. Aluminum Sheet, Plate, Angle and Flat Bar: **ASTM B209-14** Alloy 6063.
 - a) Exterior aluminum elements shall receive a clear anodized finish to match the aluminum storefront.
 - b) Interior aluminum elements shall be finished as described and approved in 1.4 D above.

2. Welding shall only be performed in off-site fabricators shop and shall comply with AWS D1.2/D1.2M:2014. Welds shall be ground smooth and finished prior to anodizing. Contractor shall confirm alloy welding.
3. All aluminum shall be saw or laser cut to size. Crushed shearing will not be accepted. Aluminum cuts shall be square, clean and burr-free.
4. All 1/4" thick edges shall be finished clean and crisp 90 degree angles. Except for internal joints between aluminum components, all external material edges shall be slightly eased. All exposed corners shall be rounded to 1/8" radius.
5. Pre-drill as required for all attachment points. Countersink holes to receive flat head screws.
6. Provide laser thru cut text as indicated.
7. Protect all finished aluminum in field. Remove protection upon substantial completion of project or as required to demonstrate quality control.

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.
- 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 (except aluminum which shall not be field welded) : 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 05600
UNISTRUT METAL FRAMING

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Provide all Unistrut Metal Framing material, fittings, and related accessories (Strut System) as indicated on the Contract Drawings.
- B. Provide all labor, supervision, engineering, and fabrication required for installation of the Strut System in accordance with the Contract Drawings and as specified herein.
- C. Related work specified elsewhere.

1.2 QUALITY ASSURANCE

- A. Manufacturer's qualifications:
 - 1. The manufacturer shall not have had less than 3 years experience in manufacturing Strut System. All submission requirements are to be coordinated with the Commissioner.
 - 2. The manufacturer must certify in writing all components supplied have been produced in accordance with an established quality assurance Program.
 - 3. All Strut System components must be supplied by a single manufacturer.
- B. Installer's qualifications:
 - 1. Installer shall comply with the manufacturer's certification and recommendations to ensure product warranty is not negated.
- C. Standards:
 - 1. Work shall meet the requirements of the following standards:
 - a. Federal, State, and Local codes.
 - b. American Iron and Steel Institute (AISI) Specifications for the Design of Cold-Formed Steel Structural Members, latest edition.
 - c. American Society for Testing and Materials (ASTM).

1.3 SUBMITTALS

- A. Structural Calculations and Shop Drawings
 - 1. Submit structural calculations for approval by the Commissioner. Calculations may include, but not be limited to:
 - a. Description of design criteria.
 - b. Stress and deflection analysis.
 - c. Selection of Unistrut framing members, fittings, and accessories.
 - 2. Submit all shop/assembly drawings necessary to completely install the Strut System in compliance with the Contract Drawings.
 - 3. Submit all pertinent manufacturer's published data.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. All material is to be delivered to the work site in original factory packaging to avoid damage to the finish.
- B. Upon delivery to the work site, all components shall be protected from the elements by shelter or other covering.

1.5 GUARANTEE

- A. Separate guarantees shall be issued from the contractor and manufacturer, valid for a period of (1) year, against any defects that may arise from the installation of manufacture of the Strut System components.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. All Strut System components shall be as manufactured by UNISTRUT CORPORATION, THOMAS & BETTS, STRUT & SUPPLY, INC., or approved equal as determined by the Commissioner.

2.2 MATERIALS

- A. All channel members shall be fabricated from structural grade steel conforming to one of the following ASTM specifications: A 1011SS GR 33, A 653 GR 33.
- B. All fittings shall be fabricated from steel conforming to one of the following ASTM specifications: A 575, A 576, A 36 or A 635.
- C. Any substitutions of product or manufacturer must be approved in writing by the Commissioner.

2.3 FINISHES

- A. Strut System components shall be finished in accordance with one of the following standards:
 - 1. ELECTRO-GALVANIZED (EG)
Electrolytically zinc coated per ASTM B 633 Type III SC 1.
 - 2. PRE-GALVANIZED (PG)
Zinc coated by hot-dipped process prior to roll forming. The zinc weight shall be G90 conforming to ASTM a 653.
 - 3. HOT-DIPPED GALVANIZED (HG)
Zinc coated after all manufacturing operations are complete. Coating shall conform to ASTM A 123 or A 153.
 - 4. SPECIAL COATING / MATERIAL
(Describe as applicable)

PART 3 EXECUTION

3.1 EXAMINATION

- A. The installer shall inspect the work area prior to installation. If work area conditions are unsatisfactory, installation shall not proceed until satisfactory corrections are completed.

3.2 INSTALLATION

- A. Installation shall be accomplished by a fully trained manufacturer authorized installer.
- B. Set Strut System components into final position true to line, level and plumb, in accordance with approved shop drawings.
- C. Anchor material firmly in place. Tighten all connections to their recommended torque.

3.3 CLEANUP

- A. Upon completion of this section of work, remove all protective wraps and debris. Repair any damage due to installation of this section of work.

3.4 PROTECTION

- A. During installation, it shall be the responsibility of the Contractor to protect this work from damage.
- B. Upon completion of this scope of work, it shall become the responsibility of the Contractor to protect this work from damage during the remainder of construction on the project and until substantial completion.

END OF SECTION 05600

SECTION 06200

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 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 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 D2016.

1.4 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.

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- 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 08700 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.

1.5 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 COMMISSIONER.
- 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 for rough carpentry work shall conform to PS-74 and APA standards best grade for intended use.
- 4. Plywood 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 shall be fire retardant treated to comply with the AWWA 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 E84.
 - 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 "Flameproof LHC" made by Osmose or "Dricon" made by Koppers. Provide UL approve identification on treated materials.

2. For exterior blocking, roofing and sheet metal, pressure treat wood with water-borne, "CCA-Oxide: preservative complying with AWPB LP-2 (.23 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" made by Koppers, or K33 made by Osmose, or approved equal.
3. Treated wood which is cut or otherwise damaged shall be further treated in accordance with the AWPB Standard M-4.

2.2 HARDWARE

- A. Rough Hardware for Exterior Use: Hot-dipped galvanized, aluminum or an approved non-ferrous metal.
- 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 COMMISSIONER.

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 08700 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 08100.
- 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 CITY OF NEW YORK.
- 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. Doors and Frames

- 1. Install units and accessories in accordance with the final shop drawings, manufacturer's data, and as herein specified.
- 2. Setting Masonry Anchorage Devices
 - a. Provide masonry anchorage devices where required for securing frames to in-place concrete and masonry construction.
 - b. Set anchorage devices opposite each anchor location, in accordance with details on final shop drawings and anchorage device manufacturer's instructions. Leave drilled holes rough, not reamed, and free from dust and debris.

3. Placing Frames: Prior to installation, all frames must be checked and corrected for size, swing, squareness, alignment, twist and plumbness. Permissible installation tolerances shall not exceed the following:
 - a. Squareness +/- 1/16": Measured on a line, 90 degrees from one jamb, at the upper corner of the frame at the other jamb.
 - b. Alignment +/- 1/16": Measured on jambs on a horizontal line parallel to the plane of the wall.
 - c. Twist +/- 1/16": Measured at face corners of jambs on parallel lines perpendicular to the plane of the wall.
 - d. Plumbness +/- 1/16": Measured on the jamb at the floor.
 - e. In masonry construction, building-in of anchors and grouting of frames is included in Section 04200 of the specification.
 - f. At in-place concrete or masonry construction, set frames and secure in place with machine screws and masonry anchorage devices.
 - g. At steel stud partitions, attach wall anchors to studs with tapping screws. Spot grout anchors with USG Durabond Joint Compound just before board is inserted into frame; coordinate with Section 09250.
 - h. Place frames at fire-rated openings in accordance with NFPA Standard No. 80.
 - i. Make field splices in frames as detailed on final shop drawings, welded and finished to match factory work.
 - j. After wall construction is complete, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
4. Door Installation: Fit doors accurately in their respective frames, with the following edge clearances:
 - a. Between Doors and Frames, at Head and Jambs: 1/8"
 - b. At Door Sills Where No Threshold is Used: 3/8" max.
 - c. At Door Sills Where Threshold is Used: 3/4" max. above finished floor.*
 - d. Between Edges of Pairs of Doors: 1/8".
 - e. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.
 - f. * Finished floor is defined as the top surface of the floor, except when resilient tile or carpet is used, when it is the top of the concrete slab. Where the carpet is more than 1/2" thick, allow 1/4" clearance.

B. 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

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SECTION 06400
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. 100% bamboo plywood casework.
 2. Hardware for casework.
 3. Wood shelving.
 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 QUALITY STANDARDS

- A. The quality standards of the Architectural Woodwork Institute, 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, unless otherwise modified herein.
- B. In the event of a dispute as to the quality grade (or grades), all parties involved will (1) call upon the Architectural Woodwork Institute for an inspection under AWI's established inspection procedures, and (2) 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.

1.4 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. 12" square each type of wood.

1.5 QUALIFICATIONS

- A. The work of this Section shall be provided by a firm having three (3) years experience on projects of similar size and quality to that specified and shown.

1.6 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.

1.7 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 of 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 COMMISSIONER.
- 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 or work of this Section are subject to rejection and replacement with new by Contractor, at no cost to CITY OF NEW YORK.

1.8 JOB CONDITIONS

- A. Humidity and Temperature Controls: Advise Contractor of requirements for maintaining heating, cooling and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content specified for woodwork.

- 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.

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. Maintain temperature and relative humidity during fabrication, storage and finishing operations so that moisture content values for woodwork at time of installation do not exceed seven (7) percent.
- 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: COMMISSIONER 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. Route 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 06200.
- 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. Eco Plywood: Provide product(S) manufactured by Smith and Fong, EcoSupply, Kirei or approved equal. The following names and model numbers are those of Smith and Fong; other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

1. 100% bamboo plywood:
 - a. 3-ply bamboo plywood; Plyboo NATURAL, Edge Grain bamboo. 3/4" x 48" x 96"/BP-V4896N
 - b. 1-ply bamboo plywood; Plyboo NATURAL, Edge Grain bamboo.
 - For visible surfaces 48" or more in width or 96" or less in length: 3/4" x 48" x 96"/BP-S4896VN
 - For visible surfaces 120" or more in length or 30" or less in width: 3/4" x 30" x 120"/BP-S30120VN
 - c. 3-ply bamboo plywood: Plyboo NATURAL, Edge Grain bamboo 1" x 48" x 96"/BP-V0196N

2.3 MISCELLANEOUS PRODUCTS

A. DRAWER BOXES

1. General: Factory natural/clear coat finished, maple, square edge, 6mm inset bottom, dovetail corner joints; 1/2" thick side wall, 3/8" thk bottom.
 - a. WalzCraft 2600 Hemstock Street La Crosse, WI
 - b. Drawer Depot, 9435 Bond Ave., El Cajon, CA
 - c. Keystone Wood Specialties, Lancaster, PA
 - d. Maplecraft, USA, Albion, PA
2. Hanging file type: Factory natural/clear coat finished, maple, square edge, 6mm inset bottom, dovetail corner joints; 1/2" thick side wall, 3/8" thk bottom. Left/Right file bar slot with 1/2" high aluminum inset hanging bar. Box height = 9 1/4" folder size + bottom panel thickness + bottom panel inset dimension.
 - a. WalzCraft 2600 Hemstock Street La Crosse, WI
 - b. Drawer Depot, 9435 Bond Ave., El Cajon, CA
 - c. Keystone Wood Specialties, Lancaster, PA
 - d. Maplecraft, USA, Albion, PA

B. 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.

C. 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.

2.4 CABINET HARDWARE

- A. Provide products manufactured by Sugatsune, Hafele, Hettich or approved equal. Manufacturers noted herein are acceptable subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:
- B. Architectural Woodwork Hardware:
 - 1. Hinges: Hafele concealed hinges
 - 2. Catches: Magnetic; top and bottom.
 - 3. Pulls (edge): SUGATSUNE edge pull SN-120/S
 - 4. Pulls (Sliding Cabinet Doors): SUGATSUNE 3511038/SN
 - a. Sugatsune
 - b. Knapé & Vogt
 - c. Ives
 - 5. Drawer Locks (except Kitchen): Gang lock + master key
 - 6. Sliding Cabinet Door Locks: Plunger bolt type for wood doors, dull chrome
 - a. National Cabinet Lock
 - b. Cabinetmakerssupply.com
 - 7. Drawer Slides: Full extension, 100 lb. capacity (general).; Heavy duty full extension, 150-500 lb capacity.
 - a. Grant
 - b. Knapé & Vogt
 - 8. Shelf Supports: Pin and grommet system equal to No. 282.10.700 angle pin and 282.50.704 grommet made by Hafele
 - a. Knapé & Vogt
 - b. Parker
 - c. Hafele
 - 9. Self Adjusting Sliding Door Trolley System: Slide 89101933; top and bottom aluminum track 8910204210.
 - a. Richelieu
 - b. Parker
 - c. Hafele
 - d. Knapé & Vogt
 - 10. Finish: Satin Stainless Steel, unless otherwise indicated..

2.5 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 COMMISSIONER.
- 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.

2.6 FABRICATION - SPECIFIC ITEMS

A. Casework

- 1. Provide casework in accordance with AWI Section 400, Premium Grade.
- 2. Include all preparations for mechanical, electrical, telephone and plumbing work required.
- 3. Provide cabinet hardware for casework as shown.
- 4. Provide dust panels in body webs and between drawer units.
- 5. Provide wood veneers for exposed surfaces as specified herein before.
- 6. Hollow core doors will not be permitted.
- 7. Provide matching veneers for edge treatments of case body members where transparent finishes are indicated or specified.
- 8. Provide drawers with slides as specified. Drawers shall not rest on web body frames.
- 9. Provide wood veneers for transparent finish, of matching and continuing grain, for drawer and door edges.

2.7 SHOP FINISHING

- A. Preparation for finishing: Comply with AWS Section 5 – Finishing (2009 AWI, AWMAC, WI – Architectural Woodwork Standards – 1st Edition) for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork as applicable to each unit of work.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply one coat to back of paneling.

B. Transparent Finish

1. Grade: Custom
2. Clear Finish:
 - 1st Coat – Clear Vinyl Acrylic Latex Enamel Underbody --1.1 Mils DFT
 - 2nd & 3rd Coats – Clear Satin Vinyl Acrylic Latex--1.3 Mils DFT/each coat
 - 4th Coat (Countertops/work surfaces) – Clear Satin Vinyl Acrylic Latex--1.3 Mils DFT/each coat
3. Staining: None
4. Sheen: satin, 31-45 gloss units measured on 60-degree gloss meter per astm-d523.

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 GROUNDS, 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 FINISHING

- A. Apply durable, transparent finish in shop.

3.5 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 COMMISSIONER.

- 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.

3.6 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 COMMISSIONER'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 CITY OF NEW YORK, the Contractor shall, in the presence of the COMMISSIONER, 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 COMMISSIONER and CITY OF NEW YORK.
- D. When directed by the CITY OF NEW YORK, 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.

3.7 GENERAL INSTALLATION

- A. 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.
- B. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- C. 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.

3.8 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 COMMISSIONER every facility for inspection of work at shop or mill at such times as the COMMISSIONER 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 COMMISSIONER'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 COMMISSIONER. 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. Cabinetry woodwork concealed or not readily exposed to view when open or closed may be plywood.
 2. Drawer sides and backs shall be 1/2" thick solid clear selected maple, 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", but not greater than 48", shelves shall be 1" thick. Shelf spans greater than 48" shall be 1 1/2" 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

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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.

3.9 PAINTING AND FINISHING

- A. General: All painting and finishing work of this Section shall be shop applied, unless otherwise noted, as specified below. All painting and finishing shall match approved samples.
- B. 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.
- C. Field Touch-Up: Field touch-up shall be the responsibility of the installing Subcontractor, and shall include the filling and touch-up of exposed job made nail or screw holes, refinishing of raw surfaces resulting from job fitting, repair of job inflicted scratches and mars, and final cleaning up of the finished surfaces.

3.10 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 or other damage until final completion and acceptance of the project by the CITY OF NEW YORK. Repair or replace all defective units prior to final inspection as directed by the COMMISSIONER. Any units that cannot be satisfactorily repaired in the opinion of the COMMISSIONER shall be replaced with new units of same original design, at no additional cost to the CITY OF NEW YORK.

END OF SECTION

SECTION 07130
SHEET MEMBRANE 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 sheet membrane waterproofing as shown on the drawings and/or specified herein, including but is not necessarily limited to the following:

1. Sheet membrane waterproofing, for foundation vertical surfaces.
2. Sheet membrane waterproofing for above grade walls.

1.3 SUBMITTALS

- A. Shop Drawings: Typical installation details, showing details at flashings, at terminations, at joints, at intersection of horizontal and vertical surfaces, and at penetrations in membrane system.
- B. Samples - Submit
1. Membrane, 6" x 6" samples.
 2. 6" x 6" sample of flashing.
 3. 6" x 6" sample of drainage board.
- C. Manufacturer's literature: Submit manufacturer's technical, safety data sheets, and installation literature for all materials of this Section. Submit Independent Test data indicating that membrane meets properties specified herein.
- D. Contractor's Certification: Submit per Article 1.7.

1.4 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 with expiration date 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.
- D. Liquid materials, such as adhesives, thinners and primers, shall be stored in areas away from sparks, open flames and excessive heat.

1.5 JOB CONDITIONS

- A. No application of liquid applied urethane flashing shall commence or proceed during inclement weather, or the threat of imminent precipitation.
- B. All surfaces to receive the system shall be thoroughly dry and free of dew or frost.
- C. Application temperatures are not limited except that materials shall be stored until time of mixing at temperatures above 60 deg. F. to maintain a consistency suitable for mixing. Do no work below 40 deg. F.
- D. Prior to and during application, all dirt and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air, or similar methods.

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- E. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

1.6 WARRANTY

- A. The manufacturer shall 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) years 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.

1.7 QUALITY ASSURANCE

- A. Preinstallation Conference: Approximately 2 weeks prior to scheduled commencement of waterproofing installation, meet at Project site with Waterproofing Installer; preparer of substrate to receive waterproofing; installers of other work in and around waterproofing that must precede, follow, or penetrate waterproofing (including Mechanical and Electrical Installers as applicable); COMMISSIONER; CITY OF NEW YORK; and waterproofing manufacturer's representative to review materials, procedures, schedules, and other requirements and conditions related to installing waterproofing.

B. Qualifications of Subcontractors

1. Subcontractors: All work of this Section shall be performed by a subcontractor who is approved by the manufacturer of the waterproofing material.
2. Qualifications of Subcontractors: Subcontractors shall submit evidence of being bona fide waterproofing subcontractors, and that they are approved by the manufacturer of the waterproofing material for the installation of the manufacturer's material in accordance with the requirements of this Section.
 - a. Subcontractor shall submit a letter from manufacturer of waterproofing material stating that subcontractor is approved by the manufacturer for the application of the waterproofing systems specified and accepted for use on the Project.
 - b. Letter shall certify that the subcontractor has previously and satisfactorily applied the waterproofing systems specified herein, under manufacturer's supervision.
 - c. Letter shall be on manufacturer's letterhead and shall be signed by an officer of the company, not by a local sales representative.

C. Manufacturers Representative/Contractors Certification

1. Representative of the waterproofing material manufacturer shall be required to provide field instructions and supervision for the installation of the waterproofing systems at the start of the work of this Section.
2. The manufacturer's representative shall be required to make sure that the workmen for waterproofing systems on the site of the Project are fully instructed and trained in the handling and application of all the materials, and shall see that all the materials are correctly installed.
3. Upon completion of the Installation, submit to the COMMISSIONER written certification that the representative of the manufacturer of the waterproofing material has supervised the work of this Section and that all materials were correctly installed.

1.8 PROTECTION

- A. Against Loads: Protect work of this Section against concentrated loads and any other loads or equipment that would damage the materials or work.

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- B. Against Traffic: Do not permit traffic on horizontally installed work of this Section, except for workmen doing the work, during the installation, and after the installation until membrane systems are covered with protective boards or with the specified finishing materials.
- C. Against Damage: Protect vertically installed work of this section from damage by reinforcing and placement.
 - 1. Take and maintain necessary preventative measures to protect work of this Section from damage until Project is accepted.
 - 2. Rejection of Damaged Work
 - a. Damaged materials or work will be rejected.
 - b. Rejected materials or work must be immediately removed and replaced with new materials.

1.9 FIELD QUALITY CONTROL

- A. Construction Traffic:
 - 1. Limit construction traffic over completed membrane.
 - 2. Contractor shall provide 1/2 in. plywood protection layer, where construction traffic is unavoidable.
- B. Inform COMMISSIONER in writing on a daily basis of any of the following events. State specific location of each occurrence.
 - 1. Buckling to the Waterproofing and other deformations as a result of ground water events.
 - 2. Leakage through the finished waterproofing installation.
 - 3. Damage by other trades.
- C. Provide Manufacturer Representative report (prior to backfill) stating that the waterproofing has been inspected and is acceptable.

PART 2 PRODUCTS

2.1 WATERPROOFING MEMBRANE

- A. Provide products manufactured by W.R. Meadows, Carlisle, Henry or approved equal. The following names and model numbers are those of W.R. Meadows and shall form the basis of product performance; other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:
- B. Provide foundation wall waterproofing sheet waterproofing membrane, 90 mils thick, composed of combination of weather coated asphaltic protection course layer bonded to an asphalt saturated carrier sheet to which is bonded polymeric membrane with a release liner equal to Mel-Gard.
- C. Wall waterproofing shall be 60 mils peel and stick sheet equal to Mel-Rol.
- D. PRIMER: Solvent-based voc adhesive equal to Mel-Prime.
- E. Protection Board: 1/8" hard asphaltic board PC-2.
- F. Drainage Mat: Dimple-raised, molded polystyrene sheet bonded to high strength polypropylene fabric. This geocomposite allows the passage of moisture through the fabric while preventing

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fine soils from entering the drainage channel. Various drain designs are available, depending on soil pressure and flow specifications. (An optional polyester backing film is available when used in conjunction with flexible waterproofing material.) Basis of Design equal to "Mel-Drain" 5035 or 5035B. equal to Mel-Drain .

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where membrane 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 PREPARATION OF SURFACES TO RECEIVE WATERPROOFING

- A. Prepare surfaces in accordance with manufacturers recommendations.

3.3 INSTALLATION

- A. General: Conform to recommendations and published specifications of the manufacturer including environmental requirements.

B. Foundation Walls

1. General: The membrane, when in place must withstand a minimum static ground water pressure of 150 feet.
2. Priming: Application of primer shall be limited to what can be covered with waterproofing membrane in a given work day. Primed areas not covered by membrane during the work day will be reprimed. Apply primer by spray, roller or brush at a rate of 250 - 350 sq. ft. per gallon. Roller shall be natural material such as lamb's wool, having a nap of approximately one inch. Primer shall be applied to a clean, dry, frost-free and dust-free surface. Sufficient primer must be used on the day surface to condition it to a dust-free state suitable for the application of waterproofing membranes.
3. Membrane Installation: Apply waterproofing membrane vertically in sections of 8' in length or less. On higher walls apply two or more sections with the upper overlapping the lower by a least 2-1/2". Press all membrane in place with heavy hand pressure or rollers during application.
4. Sealing Edges: Waterproofing membrane shall be applied over the edge of the slab or over the top of the foundation or parapet wall. If the membranes are terminated on the vertical surface, a reglet or counter flashing may be used or the membrane may be terminated directly on the vertical surface by pressing very firmly to the wall. Press edges with a metal or hardwood tool such as a hammer or knife handle. Apply a troweled bead of mastic to all vertical and horizontal terminations.
5. Sealing Seams: All edges and end seams must be overlapped at least 2-1/2". Apply succeeding sheets with a minimum 2-1/2" overlap and stagger end laps. Roll or press the entire membrane firmly and completely as soon as possible. Patch misaligned or inadequately lapped seams with membrane. Slit nay fish mouths, overlap the flaps, and repair with a patch of waterproof membrane and press or roll in place. The edges of the patch shall be sealed with a troweling of mastic. Laps within 12" of all corners shall be sealed with a troweling of mastic.
6. Corner Forming: Outside corners must be free of sharp edges. Inside corners shall receive a fillet formed with membrane, latex modified cement mortar equal to Daraweld C made by Grace mixed with cement mortar or epoxy mortar. Do not use fiber or wood cants. One of two methods may be used for treating corners at the Contractor's option:

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- a. Apply liquid membrane 6" in each direction from the corner and form a fillet with a minimum 3/4" face.
- b. Install an 11" minimum strip of membrane centered on the corner. Install membrane over the treated inside and outside corners.

7. Apply drainage mat in accordance with manufacturer's recommendations.

3.4 SEAM REINFORCEMENT

- A. Provide a 6 in. strip of bituminous sheet membrane centered behind all laps.
- B. At locations where a salvage edge is not present and at end laps, lap sheets 6 in., apply a 1/8 in. thick by 6 in. wide application of liquid membrane between sheets, to provide a 6 in. wide seal.
- C. Integration of old onto new pre-applied sheet membrane.
 1. Integration of sheet membrane onto sheet membrane that has been installed in excess of 30 days prior
 - a. Lap sheets 12 in., apply a 1/8 in. thick by 12 in. wide application of fluid membrane between sheets, to provide a 12 in. wide seal at this location.
 - b. Install waterproofing tape centered at edge of lap and roll firmly into place with an approved roller.
 - c. Install additional waterproofing tape to cover white film that has been installed over 30 days prior.
 2. Repair of pre-applied sheet membrane
 - a. Scratch on white coating exposing underlying black surfing of sheet membrane. Install waterproofing tape at areas where the white coating of the membrane is damaged, including boot scuff marks and abrasions by rebar.
 - b. Damage or Puncture of Sheet Membrane: Install Patch of short membrane set in membrane. Patch must extend 3 in. in every direction around extent of damaged area. Install waterproofing tape centered over the edge of the patch. If the damaged area does not have 5 in. of sound material around it, inject membrane into puncture until membrane backs out, and proceed with patch as space allows.

3.5 CLEAN-UP

- A. Upon completion of the waterproofing system, the Contractor shall remove all equipment, material and debris from the work and storage area, and leave those areas in an undamaged and acceptable condition.

END OF SECTION

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SECTION 07210
BUILDING 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 building insulation as shown on the drawings and/or specified herein, including but is not limited to, the following:
 - 1. Cavity wall insulation within masonry cavity.
 - 2. Miscellaneous blanket insulation.
 - 3. Attachment devices.

1.3 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.

1.4 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.

PART 2 PRODUCTS

2.1 CAVITY WALL INSULATION WITHIN MASONRY CAVITY

- A. Provide extruded polystyrene board insulation equal to Styrofoam "Cavitymate Plus" manufactured by Dow Chemical Co. or approved equal made by Owens Corning or PACTIV Building Products conforming to ASTM C578, Type IV with a maximum flame spread and smoke developed indices of 15 and 165 respectively.
- B. Boards shall be 16" wide x 96" long; boards shall be 1" thick unless otherwise noted on the drawings.
- C. Insulation shall have an aged R value of not less than 5/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 Certaineed conforming to ASTM C612, Type 1A or ASTM C665, Type III, Class A, faced on one side with foil

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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. Eckel Industries, Inc.

- 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.

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. Exercise extreme care to avoid damage and soiling of faces on insulation units which will be exposed to view. Align joints accurately, with adjoining surfaces set flush.

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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.
12. Furnish mason trades rigid insulation to be installed within masonry cavity.

3.3 INSTALLATION OF CAVITY-WALL 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

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SECTION 07211
PERIMETER FOUNDATION INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Furnish and install foundation insulation against foundations as shown on Drawings.

1.2 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. American Society for Testing & Materials (ASTM).

1.3 SUBMITTALS

- A. Product Data: Provide manufacturer's information on material and installation instructions.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be labeled with manufacturer's name and product identification.
- B. Store materials on the site in a dry area protected from the weather.
- C. Protect with white polyethylene film or light colored covering. Do not leave exposed to direct sunlight.
- D. Do not leave exposed in areas where traffic might cause mechanical damage to foam.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Dow Chemical U.S.A., Midland, Michigan 48640
- B. UC Industries, Inc., Parsippany, N.J. 07054

2.2 MATERIAL

- A. Extruded polystyrene foam, with a high density, smooth, extruded-skin surface and square (butt) edges.
 - 1. "Styrofoam" by Dow Chemical Company.
 - 2. Formular 250 by UC Industries, Inc.
- B. Thickness shall be in accordance with Drawings, but not less than 2". Insulation shall meet physical property requirements given in ASTM 578 and Federal Specifications HH-1524C for Type IV materials.
- C. Product shall not be produced with or contain any of the U.S. EPA regulated CFC compounds which are listed in the Montreal Protocol.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that concrete surfaces are free of defects or protrusions and ready to receive insulation. Do not begin installation until defects are remedied.

3.2 INSTALLATION

- A. Install foam board horizontally against foundation wall as shown on Drawings and in accordance with manufacturer's instructions.
- B. Foam board shall be tightly butted.
- C. Shape foam board around obstructions by means of saw, knife, or other sharp tool.

3.3 PROTECTION

- A. Protect foam board from sunlight until board is backfilled against.
- B. Backfill against foam board carefully in order to prevent displacement and mechanical damage.

END OF SECTION

SECTION 07270
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.

1.3 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 B.S.A. approval for use in New York City.

1.4 SUBMITTALS

- A. Submit manufacturer's product literature for each type of firestop material to be installed. Literature shall indicate product characteristics, typical used, performance, limitation criteria, test data and indicate 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.

1.5 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 or ethylene glycol.
- 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.

1.6 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.

1.7 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.

1.8 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 in accordance with the NYC required special inspections.

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 COMMISSIONER.
- 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 INSTALLATION (FIRE SAFING)

- A. Provide min. 4 pcf Thermafiber as manufactured by U.S. Gypsum Co., min. 4 pcf FBX Safing Insulation as manufactured by Fibrex, or min. 4 pcf Ceramic Fiber Insulation as manufactured by Manville Corp., 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 E814.

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 firestopping's seal with substrates.

3.3 CONDITIONS REQUIRING FIRESTOPPING

- A. 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 Warnock Hersey, 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.
- B. 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.

- C. 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 a 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.

11/20/15

3.7 FIELD QUALITY CONTROL

- A. Inspecting agency employed and paid by the CITY OF NEW YORK 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, CITY OF NEW YORK and COMMISSIONER.
- 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 07420
ZINC CLADDING AND TRIM

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 the design, engineering, fabrication and installation including all labor, materials, equipment and services necessary to complete the zinc cladding and trim as shown on the drawings and/or specified herein, including, but not limited to, the following:
 - 1. Corrugated Zinc panels and related accessories .
 - 2. Connection hardware for attachment of zinc panels to building structure.
 - 3. Drilling and tapping of structure as required for fastening of all work included in this Section.
 - 4. Cutting and flashing required for penetrations.
 - 5. Roofing Specialties
 - a) Canopy fascia
 - b) Parapet coping.
 - c) Canopy Gravel Stop.
 - d) Roof scuppers, sumps and drain pipes.
 - 6. Thermal Movements:
 - a) Provide metal panels, including flashings, trim and accessories that allows for thermal movement.
 - b) Provide fasteners and components that resist rotation and avoid shear stress as a result of system thermal movements.

1.3 QUALITY ASSURANCE

- A. Qualifications of Installers:
 - 1. The installer shall be currently approved by the manufacturer.
 - 2. Use only competent and skilled mechanics completely familiar with and specifically trained and experienced in the application of materials specified herein, and the manufacturer's currently recommended methods of installation.

3. Installer: A firm which can show proof of three (3) years of successful experience with the installation of metal panel system or of similar type as determined by the COMMISSIONER and equivalent scope.
4. Installer must wear gloves during handling of zinc panels.
5. Manufacturer's certifications: Secure visits to the job site by a representative of the panel system manufacturer, as required by the manufacturer's warranty, who shall inspect and shall certify that:
 6. The surfaces to which the panels was applied were in a condition suitable for this application.
 7. The materials installed complied in all respects with the requirements of this Section of these specifications.
 8. The materials were installed in complete accordance with the manufacturer's current recommendations.

1.4 PERFORMANCE CRITERIA

- A. Construct metal panels and support system (substructure) to provide for expansion and contraction of various components as will be caused by metal temperature range of 200 deg. F without causing harmful buckling, undue stress on fasteners, or other detrimental effects.
- B. At design loadings and pressures panel system shall conform to the following criteria:
 1. Perpendicular to plane of building component (wall, parapet, coping, soffit, and the like), net deflection of metal panels shall not exceed $L/60$. Deflection shall be measured relative to horizontal and vertical support members with allowable deflection determined by the lesser dimension. Deflection of panel under design load shall not result in any permanent set of the material beyond tolerance specified herein.
 2. Perpendicular to plane of building component, net deflection of substructure framing members shall not exceed $L/240$ of span or $3/4$ in., whichever is less. Span is defined as the distance between center line of anchor to building fastening. For cantilevers, span is defined as two times the distance between last anchor to building fastening center line and cantilever end.
 3. Parallel to plane of building component, net deflection, including horizontal rail sag, of substructure framing members shall not exceed 0.062 in. in 8'0" feet.
 4. At connection points of substructure framing members to anchors, combined movement of anchor relative to anchor, shall not exceed $1/16$ in. in any direction.
 5. Stresses shall not exceed allowable values established by specifications in referenced standards, by governing codes, or authorities. In no case shall allowable values exceed yield stresses. Where permitted by code, a $1/3$ increase in allowable stress for wind or seismic loading is acceptable, but not in combination with any reduction applied to combined loads.

C. Performance Requirements:

1. The Contractor shall demonstrate that system components and attachments to frame members for the work of this section meet or exceed building code requirements for wind loading per section 27-569 of the NYC Building Code. The components of the work of this section shall resist the pressures due to wind as prescribed in NYC Building Code reference standard RS 9-5. Wind shall be assumed to act from any direction. For continuous framing, the effects of partial loading conditions shall be considered.
2. Employ registered professional engineer, licensed to practice structural engineering in jurisdiction where Project is located, to provide data demonstrating compliance with the above applicable building codes for each component of the system including attachment to the structural frame. Shop drawing shall bear stamp of the engineer with a statement that design conforms to provisions of item 1.4.C.1. above.
3. Drawings: The drawings are diagrammatic and intended to establish basic dimension of units, sight lines, and profiles of units.
4. Attachment Considerations: Account for site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening and fracturing connection between components.
5. Contractor shall demonstrate method of separation of dissimilar metals in shop drawing submittal.

1.5 MOCK-UP

- A. CORRUGATED PANELS: For the location indicated on drawings, installed on fully assembled back up framing, the contractor shall provide a fully assembled, full scale mock-up using perforated corrugated material, trim and fasteners as specified with cut text fastened to support framing. The contractor shall make adjustments as requested by the COMMISSIONER, such as providing different perforation density to one or both text layers, and shall provide as many as two additional new fully assembled, full scale, mock-ups for review by the COMMISSIONER. Procurement and installation of material shall not proceed without written acceptance of full scale mock up by the COMMISSIONER.
- B. ROOFING SPECIALTIES: provide 5' long Fascia, Coping and gravel stop mock-ups for review and approval by the COMMISSIONER.

1.6 SUBMITTALS

- A. Manufacturer's data: Submit panel manufacturer's product data, including details of construction relative to materials, dimensions of individual components and profiles, finishes, and panel manufacturer's written and published installation instructions and installation guides. Submit for information only, metal manufacturer's specifications, installation instruction and general recommendations for panels applications and handling procedures. Include manufacturer's certification or other data substantiating that the materials comply with the requirements. Indicate by copy of transmittal that the Fabricator/Installer has received copy of manufacturer's instructions and recommendations.
- B. Samples (control): Submit panel manufacturer's samples for each type of exposed component required, including:

1. Corrugated Metal Panel System: Minimum 24" long (600mm) by actual panel width, including fasteners (2 of each) required for installation and laps.
 2. Trim and Closures: 24" long (600mm) sample of each type of trim and closure, including fasteners, cleats and components.
 3. SPECIALTIES: 24" (600mm) long sample of each type of specialty item.
- C. Samples (application)/ Corrugated Metal Panel System: Submit application height x panel width samples of each specified metal, perforation and gauge to be used. Mount at site in secure manner on roof and canopy as directed by COMMISSIONER. Samples must be mounted in place for two weeks for review and evaluation by COMMISSIONER . Provide single and double corrugated layers as directed by the COMMISSIONER.
- D. Samples (cut text quality)/ Corrugated Metal Panel System: Submit 30" x 30" sample of laser cut text.
- E. Engineering Calculations: As required by COMMISSIONER, Installer to provide wind load (positive and negative pressure) calculations based on substrate [exterior sheathing, galvanized steel sub-framing] information provided by the Contractor. Calculations to utilize fastener pullout data and known panel physical properties to provide "estimated" design performance. Submit written certification showing calculations prepared and stamped by a Professional Structural Engineer licensed and registered in the project state.
- F. Shop Drawings: Submit shop drawings showing the manner of forming, jointing and securing the metal wall panels, trim, copings, gravel stops and scupper/drainage leaders. Show expansion joint details and waterproof connections to adjoining work and at obstructions and penetrations. Show all text cut outs in panel system.
- G. Pre-Installation Conference: Prior to installation of metal panel system, participate in conference at which panel system manufacturer shall explain the proper manner of handling, installing, protecting, and cleaning panel system. Participants shall include not less than at least one qualified and experienced representative of the following:
1. CITY OF NEW YORK.
 2. COMMISSIONER.
 3. Contractor.
 4. Panel system manufacturer.
 5. Panel system installer.
- 1.7 DELIVERY, STORAGE AND HANDLING
- A. Delivery:
1. Package metal panels for protection during transportation and handling
 2. Deliver materials to site in panel manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and panel manufacturer.
 3. Deliver materials so as not to be damaged or deformed.
 4. Inspect delivered materials within 5 days from date of delivery. Report damaged materials to panel manufacturer within 5 days.
 5. Leave strippable protective UV-resistant film on metal wall panels

B. Storage and Handling:

1. Store materials in clean areas in accordance with manufacturer's instructions.
2. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

1.8 PROJECT SITE CONDITIONS

- A. Weather Limitations: Install metal panel system only when weather conditions permit installation in accordance with panel manufacturer's written and published instructions and metal wall panel installation guides.

1.9 WARRANTY

A. Warranty Period:

1. Materials: 5 years from date of substantial completion. (Provided by the Panel Manufacturer.)
2. Installation: 1 year from date of Substantial Completion. (Provided by the Installer.)

PART 2 PRODUCTS

2.1 MANUFACTURERS:

- A.. VM ZINC; RALEIGH, NC.
- B.. Rheinzink; Woburn, MA
- C.. KME America; Oak Brook, TN
- D. Jarden Zinc Products; Greenville, TN
- E. All zinc used on the project shall be supplied by the same manufacturer.

2.2 MATERIALS

- A. Corrugated Metal: factory-formed, zinc-alloy, metal wall panel.

1. Zinc Alloy: 99.995 percent electrolytic high-grade zinc with alloy additives of copper (0.08 percent to 0.20 percent), titanium (0.07 percent to 0.12 percent), and aluminum (0.015 percent).
2. Thickness: 0.039 inch/20 ga (1.00 mm).
3. Panel Backside Coating (Back side coating on panels on non-compatible supports):
 - a. Coating Thickness: 60 microns.
 - b. Abrasion Resistance, ASTM D 968, Method D: 140 liters.
4. Surface Aspect:
 - a. Pre-weathered Zinc: "QUARTZ ZINC", gray zinc with luminance "Y" between 22 and 25 on exposed side or equal approved by COMMISSIONER.

5. Dimensional Tolerances:
 - a. Coverage: Plus or minus 1/8 inch (3mm).
 - b. Ends Square: 1/16 inch (1.5mm) on 12 inches (305mm).
 - c. Flatness: 1/8 inch (3mm) on 36 inches (914mm).
 - d. Overall length: Plus or minus 1/8 inch (3mm).

- B. Metal Wall Panels:
 1. Factory formed, corrugated panels, corrugated profiled panel, 32 3/4" (832mm) nominal width, featuring 29 3/8" (746mm) coverage. Wave depth of panel is 7/8" (22mm), on 2.67" (68mm) centers. Panels are installed with exposed fastener arrangement.
 2. Corrugated panel system includes full range of fasteners, flashings, and terminations.
 3. Panels are installed vertically with exposed fasteners.

- C. The following names and model numbers are those of VM Zinc; products of other manufacturers indicated subject to meeting drawing details and performance criteria specified herein:
 1. CORRUGATED PANEL PERFORATIONS (for use in mock-ups, final perforation pattern and density will be approved by the COMMISSIONER in writing): "Quartzinc" grey" pre-weathered zinc 20 ga. 2.67" x 7/8" corrugated panels, provided in the following perforated patterns:
 - a) 1/8" dia. holes on 3/16" staggered centers (40% open)
 - b) 3/16" dia. Holes on 1/4" staggered centers (50% open)
 - c) Perforation TBD as directed by the COMMISSIONER.
 2. CANOPY FASCIA: : "Quartzinc" grey" pre-weathered zinc 22 ga. "PLUS" material (back coated); Provide manufacturer recommended maximum material lengths; ; Use manufacturer recommended joint seam between material sections. Provide all shapes and profiles required for installation.
 3. PARAPET COPING: : "Quartzinc" grey" pre-weathered zinc 22 ga. "PLUS" material (back coated); Provide manufacturer recommended maximum material lengths; Use manufacturer recommended joint seam between material sections. Provide all shapes and profiles required for installation.
 4. CANOPY GRAVEL STOP AND CORRUGATED TRIM: "Quartzinc" grey" pre-weathered zinc 20 ga. "PLUS" material (back coated); Provide manufacturer recommended maximum material lengths; Use manufacturer recommended joint seam between material sections. Provide all shapes and profiles required for installation. Angle and other rim at corrugated to have each leg bent over double.
 5. Material shall come with protective strippable covering.

- D. Fasteners and Clips: Material acceptable to corrugated metal supplier; supplied in accordance with manufacturer's recommendations to meet the load requirements specified.

- E. Miscellaneous Items: As required to complete project shall be in accordance with material and manufacturer's recommendations.

- F. Insulating Butyl Tape: Applied to contacting surfaces between dissimilar metals.

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- G. Solder: Lead-tin soft solder with 40% tin and 60% lead. Follow manufacturer's written instructions for soldering.
- H. Flux: As recommended by manufacturer.

2.3 FRAMING

- A. Provide additional sub framing components, hats, zees or similar light-gauge metal profile to provide air space as indicated on the drawings. All framing members and components shall be fabricated from ASTM A525 G90 galvanized sheet steel. Provide all secondary framing members as required for panel installation whether indicated or not on the architectural drawings.
- B. Coordinate panel sub framing support with cold-formed metal framing, plywood sheathing, exterior gypsum sheathing and furring, for complete structural support for performances indicated. Refer to Section __ for related requirements.

2.4 ACCESSORIES

- A. Provide all components necessary for a complete, functional, weatherproof assembly including, but not limited to, trim, copings, fascias, sills, flashings, counter flashings, door frame trim, corner units, clips, wall caps, copings, sealants, closures and fillers. Metal materials shall match panels and be zinc compatible.
- B. Clips & Fasteners: Provide stainless steel concealed clips and stainless steel fasteners; supplied in accordance with manufacturer's recommendations and to meet the load requirements as required by contractor's engineer calculations. Attachment clips shall permit expansion and contraction of the panel system throughout the specified temperature range. When permeable air barrier sheets are used to resist liquid water penetration at the fastener penetration, provide fasteners with watertight washer gaskets (such as self-adhered membrane).

2.5 MANUFACTURING TOLERANCES

Manufacture panel system so as not to exceed manufacturing tolerances.

Maximum deviation of any point from its theoretical mathematical position: Flatness tolerances shall not exceed one half or 50% of the allowable even tolerances for the manufacturer of the aluminum sheet as specified by the AAMA.

Measurements are on surface (s) (flat, curved, multiple curved) exposed to view.

Burden of proof that tolerances comply with these specifications lies with panel system manufacturer.

2.6 FABRICATION

- A. General: Custom fabricate sheet metal panels to comply with details shown and recommendations in SMACNA - "Architectural Sheet Metal Manual; 6th Edition that-apply to the design, dimensions (panel width and depth), geometry, metal thickness, and other characteristics of installation

indicated. Shops fabricate sheet metal wall panels and SPECIALTIES at the shop to greatest extent possible.

1. Corrugated Panels: Form corrugated panels from metal sheets or coils, with profiles as indicated on the drawings.
 2. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials that are non-compatible or could result in corrosion or deterioration of either material or finishes.
- B. Fabricate sheet metal corrugated zinc wall panels to allow for expansion in running work sufficient to prevent leakage, damage, and deterioration of the Work. Form exposed sheet metal work to fit over substructure without excessive oil canning, buckling, and tool marks, true to line and levels indicated. Panel length to be limited to 4 meters (13 feet).
- C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of splice or backer plates with one side being attached to the profile and the other side sealed with non-acidic sealant. (Fins and channels may also be substituted for expansion measures).
- D. Sealant Joints: Where movable, non-expansion type joints are indicated or required to produce weather tight seams, form metal to provide for proper installation of elastomeric sealant in compliance with SMACNA standards. In general, panel joints are intended to be dry, sealant-free, to facilitate air movement and drying behind the wall panels.
- E. Metal temperature must be maintained at a minimum temperature of 50 deg. F. during panel erection. For formation by impact or at lower temperatures, pre-heating is required to avoid cracking due to cold brittleness of zinc.
- F. **All panels shall have text factory laser cut by manufacturer approved laser cutting company having minimum three years experience in CAD-CAM laser cutting procedures.**

2.7 DISSIMILAR METALS PROTECTION

- A. Contact between dissimilar metal surfaces shall be avoided. Where contact occurs, isolate the surfaces from each other.
- B. Taping or gasketing with a non-absorptive EPDM material, as recommended by metal panel manufacturer
- C. Unless approved in writing by the project management team, painting shall not be utilized for dissimilar metals separation, as assembly movement can erode the paint over time, allowing galvanic action to occur.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, supports, and other conditions affecting performance of work.
 - 1. Verify that substrate is plumb, sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provision has been made for piping, flashings, and penetrations through metal wall panel system.
 - 2. Examine primary and secondary framing to verify that girts, angles, channels, and other structural panel support members, sheathing, and anchorages have been installed correctly and are spaced properly.
 - 3. Prepare written report, endorsed by installer, listing conditions detrimental to performance of Work of this section. Submit copy of report to the COMMISSIONER.

- B. Examine roughing-in for components and systems penetrating to verify actual locations of penetrations relative to seam locations of metal panels before installation.
 - A. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify COMMISSIONER promptly.
- B. General: Engage a licensed surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate panel supports.
- C. Prepare building component surface (s) to be in contact with panel system in compliance with building component manufacturers' published recommendations and those of panel system manufacturer prior to installation of panel system components.
- D. Actual position of building components to which panel system is to be attached must be within the following dimensions of their theoretical position:
 - 1. Horizontally, perpendicular (at right angle, 90 deg) to panel face: Plus (out) 1/8 in. or minus (in) 1/8 in.
 - 2. Horizontally, parallel with panel face: Left 1 in. or right 1 in.
 - 3. Vertically, parallel with panel face: Higher (up) 1 in. or lower (down) 1 in.

3.3 INSTALLATION

- A. Manufacturer's Recommendations: Except as otherwise shown or specified, comply with recommendations and instructions of manufacturer of corrugated zinc panel being fabricated and installed.
 - 1. Do not install in inclement weather
 - 2. Do not install over a damp substrate

3. If covering of corrugated zinc panels is required, provide free airflow around the zinc material in accordance with manufacturer's requirement to prevent white rust.
 4. Metal Protection: Do not install panels with non-compatible materials. Protect the metal wall panels from masonry and products containing lime by leaving the protective coating on the zinc until project and clean-up completion.
- B. Install work to be truly straight and square or conform to curvilinear geometry indicated on drawings.
1. Fabricate and install work with lines and corners of exposed units true and accurate.
 2. Form exposed faces free of buckles, excessive waves, and avoidable tool marks considering temper and reflectivity of metal.
 3. Shim and align panel units within installed tolerance of ¼ inch in 20' -0"
 4. All seams shall be of uniform appearance, dimensions and straight and level with minimum exposure of solder and sealant.
 5. Except as otherwise shown, fold back sheet metal to form a hem on concealed side of exposed edges.
 6. Form all seams to be weatherproof, leaving room for expansion and contraction with specified and required tolerances.
 7. Comply with SMACNA -Architectural Sheet Metal Manual; 6th Edition for flashings and sheet metal work.
- C. Conceal fasteners and expansion provision where possible in exposed non-corrugated zinc work, and locate so as to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- D. Provide work as indicated on approved shop drawings
1. Form and fabricate panels, vent strips, cleats, edge treatments, integral flashings, and other components of metal wall cladding to profiles, patterns, and drainage arrangements shown and as required for water shedding construction. Ensure that all shop and field fabricated bends have an acceptable "rounded" or radius bend. NO SHARP BREAKS
- E. Separate non-compatible materials with a rubberized asphalt underlayment.
- F. Install work to meet specified performance requirements.
- G. Provide a minimum of ¼" of uninterrupted ventilation at backside of corrugated panels, regardless of panel corrugation orientations. Provide base, sill, head, and parapet conditions that allow for entrance and exit of ventilation air.
- H. Surfaces that are to receive sheet metal and underlayments shall be even, smooth, sound, clean, and dry, and free from all defects. Cutting, fitting, drilling and similar operations required to accommodate the work of other trades shall be performed. Where sheet metal abuts or merges into adjacent materials, the juncture shall be executed in a manner to assure waterproof construction.
- I. Accessories and other items essential to complete the sheet metal installation, though not specifically indicated on the drawings or specified herein, shall be provided.

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- J. Sheet metal items shall be fabricated and installed in accordance with the details indicated and as specified. Sheet metal shall be formed on a bending brake. Shaping, trimming and seaming shall be done on the bench, where practicable. Bends, folds, and seams shall be made in such a manner as to avoid buckling or fullness in the metal after installation.

3.4 TOLERANCES

- A. Installation Tolerances: Maximum Alignment per Panel Variation: +/- 1/8 inch (3 mm).

3.5 CLEANING

- A. Clean exposed metal surfaces in accordance with manufacturer's instructions.
- B. Clean and neutralize flux materials. Remove excess solder.
- C. Clean finished surfaces on completion of metal installation, including removing unused fasteners, metal filings, rivet stems, pieces of flashing, and construction dust.
- D. Maintain metal panels in clean condition during construction.
- E. Remove plastic film from flashing and trim within 60 days of installation, removing all film per elevation on the same day.

3.6 PROTECTION

- A. Protect installed metal work as per manufacturer's recommendation to ensure that, except for normal weathering, metal will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

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SECTION 07500
FLUID APPLIED MEMBRANE ROOFING SYSTEM

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be for a fully reinforced cold fluid-applied polyurethane liquid resin roofing and waterproofing membrane and flashing system, and all other ancillary waterproofing work including but not limited to installation of insulation, cover boards, overburden, sealants and metal work.

- B. Proprietary Item: The item specified herein is a proprietary product. The Contractor is required to provide such item from the designated manufacturer. Substitutions are not permissible and will not be approved.
 - 1. Allowance Amount: Not to Exceed \$ 82,670

 - 2. Payment: The allowance set forth above is provided to reimburse the Contractor for purchase of the proprietary item. 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.

1.2 SECTION INCLUDES

- A. Adhered fully reinforced, cold fluid-applied, polyurethane liquid resin waterproofing membrane system including membrane, penetration flashings, base flashings, and expansion joints.
- B. Substrate preparation, cleaning, leveling and patching
- C. Insulation/cover board installation
- D. Temporary waterproofing and priming
- E. Waterproofing membrane installation
- F. Flashing installation and expansion joint installation
- G. Protective surfacing
- H. Alkalinity protection
- I. Preparation for reflective topcoat

1.3 REFERENCES

- A. National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual.
- B. ACI-308 - Recommended Practice for Curing Concrete
- C. ASTM - D638 - Test Methods for Tensile Properties of Plastics
- D. ASTM - D4258 - Standard Practice for Surface Cleaning Concrete for Coatings

- E. ASTM - D4259 - Standard Practice for Abrading Concrete
- F. ASTM - D4541 - Method for Pull-Off Strength of Coatings using Portable Adhesion Tester
- G. ASTM - E96(A) - Test Methods of Moisture Transmission of Material
- H. ASTM E-108, ANSI/UL 790 for fire resistance.
- I. International Concrete Repair Institute Guideline 03732 Concrete Surface Preparation
- J. Steel Structures Painting Council (SSPC)
- K. Tile Council of North America (TCNA) ANSI - A118.10 Tile Adhesion Shear Test
- L. UL (Underwriters Laboratories, Inc.) - Fire Hazard Classification

1.4 SUBMITTALS FOR REVIEW

- A. Membrane System Submittals and Product Data:
 - 1. Submit manufacturer's complete technical and installation literature for all materials of this Section and as required for a complete roof system installation.
 - 2. If any component of the roofing and flashing system incorporates materials, details, or installation methods which differ from those indicated in the Specifications or Drawings, submit complete product information for consideration by the COMMISSIONER prior to start of any Work which would be affected by the proposed substitutions.
 - 3. **Submit written approval from membrane manufacturer confirming compatibility of the roofing system with the existing roof deck prior to proceeding with roofing work.**
 - 4. **Manufacturer's Warranty:** Sample copy of the membrane manufacturer's 20 year warranty covering workmanship and materials, conforming to requirements of this Section.
- B. Product Samples: Submit product samples of membrane and flashing materials showing color, texture, thickness and surfacing representative of the proposed system for review and approval by the Owners Representative.
- C. Submit sample copies of both the Manufacturer and Applicator warranties for the periods stipulated. Each specimen must be a preprinted representative sample of the issuing company's standard warranty for the system specified.
- D. Submit copies of current Material Safety Data Sheets (MSDS) for all components of the work.
- E. Shop Drawings:
 - 1. Submit shop drawings of cold fluid-applied reinforced polyurethane system showing all a project plan, size, flashing details, and attachment for review and approval by the Owners Representative and Membrane Manufacturer including installation details for roofing systems to show, at a minimum, details at drains, at reinforcing, at flashing, at terminations, at joints in structure below, at intersection of horizontal and vertical surfaces, at penetrations, and at roof parapets.
 - a. Submit for typical and non-typical conditions of Project. Manufacturer's standard data sheets are not acceptable for shop drawings.
 - b. Indicate and identify materials to be incorporated in the work, dimensions, thickness of each materials and system, and relationships to adjacent construction.
 - c. When there is a proposed deviation from the Contract Documents, submit the revised detail labeled as such for approval.

1.5 QUALITY ASSURANCE

- A. Membrane Manufacturer: Company specializing in manufacturing fully reinforced cold fluid applied liquid resin waterproofing membrane systems with a minimum of three (3) years of documented applications in the United States. Membrane Manufacturer shall submit the

following certifications for review:

1. Substrates and conditions are acceptable for purpose of providing specified warranty.
2. Materials supplied shall meet the specified requirements.

B. Material Certifications:

1. Letter from the roofing membrane manufacturer certifying that the insulation is approved for use with the roofing system.
2. Certification of an approved independent testing laboratory certifying that the membrane material meets the standards indicated in item 1.3 of this section.
3. Letter from the roofing membrane manufacturer certifying that the submitted materials and installation instructions are in conformance with the latest roofing system specifications of the manufacturer.
4. Certification by an approved independent testing laboratory certifying that the precast concrete pavers proposed for the project conform to specified requirements for solar reflectance.

C. Applicator: Applicator shall submit documentation from the membrane manufacturer to verify contractor's status as an approved applicator for warranted installations.

1. Applicator's Certification:

a. Letter from the membrane manufacturer certifying that the applicator is licensed or approved to install the specified roof system, and has been in operation applying the system for 3 years or more.

b. Names, address, and telephone numbers of three buildings where the applicator has installed the same type of fluid applied hot rubberized asphalt roofing systems, which have the manufacturer's warranty issued. Include the types of roofing systems installed, the manufacturer's name, and the warranty numbers.

c. Letter from manufacturer stating that the project is registered with the manufacturer. The Contractor is to bring this to the Pre-installation conference.

D. Evaluate moisture content of substrate materials. Contractor shall determine substrate moisture content throughout the work and record with Daily Inspection Reports or other form of reporting acceptable to the Owner or designated Representative, and Membrane Manufacturer.

E. Random tests to determine tensile bond strength of membrane to substrate shall be conducted by the Contractor at the job site using an Elcometer Adhesion Tester Model 106 or similar device, or by the performance of a manual pull test. Contractor shall perform tests at the beginning of the Work, and at intervals as required to assure specified adhesion with a minimum of three (3) tests per 5000 square feet. Smaller areas shall receive a minimum of three (3) tests. Test results shall be submitted to the COMMISSIONER and the Membrane Manufacturer. Contractor shall immediately notify the COMMISSIONER and Membrane Manufacturer in the event bond test results are below specified values.

1. Adequate surface preparation will be indicated by tensile bond strength of membrane to substrate greater than or equal to 220 psi (1.5 N/mm²), as determined by use of an adhesion tester.
2. Adequate surface preparation will be indicated by 135° peel bond strength of membrane to substrate such that cohesive failure of substrate or membrane occurs before adhesive failure of membrane/substrate interface.
3. In the event the bond strengths are less than the minimum specified, additional substrate

preparation is required. Repeat testing to verify suitability of substrate preparation.

- F. Monitor quantities of installed materials. Monitor application of resin mixture, reinforcing fleece and flashing. Perform Work in accordance with manufacturer's instructions.
- G. Mock-up areas shall be used to determine required methods and tools to obtain degree of substrate preparation required by the membrane manufacturer. Conduct tests as required to verify that substrate preparation meets specified requirements. Tests shall include, but are not limited to, tensile bond strength and moisture content of substrate.
 - 1. Prepare and clean a three (3) foot (0.9 m) by three (3) foot (0.9 m) area of each substrate material type.
 - 2. Submit findings in writing to COMMISSIONER and Membrane Manufacturer.
 - 3. Mock-up areas shall be maintained for quality control for the entire project.

1.6 REGULATORY REQUIREMENTS

- A. Conform to New York City Building Codes for roofing/waterproofing assembly and fire resistance requirements.
- B. Comply with requirements of OSHA, NIOSH or local governing authority for work place safety.
- C. Comply with authority or agency "Confined Space Policy" during and throughout all work to be performed.
- D. UL: Class A Fire Hazard Classification based on job conditions.
- E. FM: Roof Assembly Classification, wind uplift requirement of 160 in accordance with FM Construction Bulletin 1-28.
- F. Conform to applicable Energy Conservation Construction Code of New York State.

1.7 PRE-INSTALLATION MEETING

- A. Convene a pre-installation meeting at the job site (1) week before starting work of this section. Require attendance of parties directly affecting work of this section, including but not limited to, Roofing/Waterproofing Specifier, Owner's Representative, Roofing/Waterproofing Contractor, and Membrane Manufacturer's Representative. Review roofing/waterproofing preparation and installation procedures, coordination and scheduling required with related work, and condition and structural loading limitations of deck/substrate.

1.8 FIELD INSPECTION SERVICES

- A. Manufacturer's technical representative shall provide the following inspections of the membrane application:
 - 1. Jobstart inspection at the beginning of each phase of the project, to review special detailing conditions and substrate preparation.
 - 2. Periodic in-progress inspections throughout duration of the project to evaluate membrane and flashing application.
 - 3. Final punch-list inspection at the completion of each phase of the project prior to installation of any surfacing or overburden materials.
 - 4. Warranty inspection to confirm completion of all punch list items, surfacing, and overburden application.

1.9 DELIVERY, STORAGE, AND PROTECTION

- A. The Contractor together with the COMMISSIONER shall define a storage area for all components. The area shall be cool, dry, out of direct sunlight, and in accordance with manufacturer's recommendations and relevant regulatory agencies. Materials shall not be stored in quantities that will exceed design loads, damage substrate materials, hinder installation or drainage.
- B. Store solvent-bearing solutions, resins, additives, inhibitors or adhesives in accordance with the MSDS and/or local fire authority. After partial use of materials replace lids promptly and tightly to prevent contamination.
- C. Roll goods shall be stored horizontally on platforms sufficiently elevated to prevent contact with water and other contaminants. DO NOT use rolls that are wet, dirty or have damaged ends.
- D. Roofing/waterproofing materials must be kept dry at all times. If stored outside, raise materials above ground or roof level on pallets and cover with a tarpaulin or other waterproof material. Plastic wrapping installed at the factory should not be used as outside storage covers.
- E. Follow manufacturer's directions for protection of materials prior to and during installation. Do not use materials that have been damaged to the point that they will not perform as specified. Fleece reinforcing materials must be clean, dry and free of all contaminants.
- F. Copies of all current MSDS for all components shall be kept on site. Provide any and all crew members with appropriate safety data information and training as it relates to the specific chemical compound he or she may be expected to deal with. Each crew member shall be fully aware of first-aid measures to be undertaken in case of incidents. Comply with requirements of OSHA, NIOSH or local governing authority for work place safety.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply roofing/waterproofing membrane during or with the threat of inclement weather.
- B. Application of cold fluid-applied reinforced polyurethane roofing/waterproofing membrane may proceed while air temperature is between 40°F (5°C) and 85°F (30°C) providing the substrate is a minimum of 5°F above the dew point.
- C. When ambient temperatures are at or expected to fall below 50°F (10°C), or reach 85°F (30°C) or higher, follow Membrane System Manufacturer's recommendations for weather related additives and application procedures.
- D. Ensure that substrate materials are dry and free of contaminants. DO NOT commence with the application unless substrate conditions are suitable. Contractor shall demonstrate that substrate conditions are suitable for the application of the materials.
- E. Odor control and elimination measures are not typically necessary, but if required by the COMMISSIONER, Contractor shall implement odor control and elimination measures prior to and during the application of the roofing/waterproofing materials. Control/elimination measures shall be field tested at off-hours and typically consists of one (1) or a multiple of the following measures:
 - 1. Sealing of air intakes with activated carbon filters. Install filters in accordance with requirements and recommendations of the filter manufacturer. Seal filters at joints and against building exterior walls to prevent leakage of unfiltered air.
 - 2. Sealing of doorways, windows, and skylights with duct tape and polyethylene sheeting to prevent leakage of air into the building.
 - 3. Erection and use of moveable enclosure(s) sized to accommodate work area(s) and stationary enclosure for resin mixing station. Enclosure shall be field constructed or pre-manufactured of fire retardant materials in compliance with local code requirements in

accordance with requirements of the COMMISSIONER. Equipment enclosure(s) with mechanical air intake/exhaust openings and Odor Control Air Cleaners, as required to clean enclosed air volume and to prevent odor migration outside the enclosure. Exhaust opening shall be sealed with activated carbon filter.

4. Protection of Contractor personnel and occupants of the structure and surrounding buildings as necessary to comply with requirements of OSHA, NIOSH and/or governing local authority.
- F. When disposing of all refuse or unused materials, observe all EPA, OSHA or local disposal requirements.

1.11 COORDINATION & PROTECTION

- A. Coordinate the work with the installation of associated metal flashings, accessories, appurtenances, etc. as the work of this section proceeds.
- B. Building components shall be protected adequately (with tarp or other suitable material) from soil, stains, or spills at all hoisting points and areas of application. Contractor shall be responsible for preventing damage from any operation under its Contract. Any such damage shall be repaired at Contractor's expense to Owner's satisfaction or be restored to original condition.
- C. Provide barricades, retaining ropes, safety elements (active/passive) and any appropriate signage required by OSHA, NIOSH, and NSC and/or the Owner or designated Representative.
- D. Protect finished roofing/waterproofing membrane from damage by other trades by the use of a cushioning layer such as 1" thick expanded polystyrene insulation and an impact layer such as ½" thick exterior-grade plywood.
- E. Do not allow waste products containing petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc. or direct steam venting to come into direct contact with the membrane unless approved by manufacturer's chemical resistance chart.

1.12 WARRANTY

- A. **Manufacturer's Premier Warranty:** Provide 20 year manufacturer's premier warranty under provisions of this section. This warranty provides for cost of labor and materials for loss of watertightness, limited to amounts necessary to effect repairs necessitated by either defective material or defects in related installation workmanship, with no dollar limitation ("NDL").
- B. **Waterproofing Contractor's Warranty:** Provide 2 year Applicator Maintenance Warranty covering workmanship for all work of this section including installation of membrane, flashings, metal work, and roofing/waterproofing accessories.
- C. Submit (2) executed copies of both the manufacturer and applicator warranties for the periods stipulated, starting from the date of substantial completion. Each warranty must be signed by an authorized representative of the issuing company.

1.13 REPAIRS/REPLACEMENT WORK

- A. Allow for masonry unit replacement for 10% of roof side parapet surface area.
- B. Allow for roof deck flash patch for 10% of roof area.

PART 2 PRODUCTS

2.1 GENERAL

- A. The products herein specified are totally pre-engineered products of the listed manufacturer and establish criteria for the approval of substitutions. Products must be part of a virtually odorless, pre-engineered, low VOC fully reinforced cold liquid applied polymeric resin waterproofing membrane system, equivalent in function, quality, composition and method of application to be considered for approval as an Approved Equal. Equal materials must meet or exceed the physical performance characteristics of the specified materials. PMMA or single component primers or resin systems will not be accepted. A minimum 165 g/m² fleece reinforcement is required.

2.2 MEMBRANE

- A. Membrane: Two-component, cold fluid-applied reinforced polyurethane waterproofing membrane with a 360 degree needle punched non-woven 165 g/m² polyester reinforcing fleece, for a finished dry film membrane thickness of .070 inch nominal per ply. Provide products manufactured and supplied by the following basis of design product:
1. Kemper System America's Kemperol 2K-PUR resin for use in an adhered waterproofing system.
- B. Physical Properties:

| Property | Value | Test Method |
|--|----------------|---------------|
| Color | White | - |
| Physical state | Cures to solid | - |
| Nominal thickness (165 fleece) | 70 mils | - |
| Tensile strength @ break | 120 lb/in | ASTM D-751 |
| Elongation | 50% | ASTM D-751 |
| Tearing strength | 5.0 lbs | ASTM D-751 |
| Puncture resistance | 140 lbf | FTMS 101-2031 |
| Dimensional stability | 0.1% | ASTM D-1204 |
| Water absorption | 2.2% | ASTM D-471 |
| Surface hardness | Shore A 85 | ASTM D-2240 |
| Water vapor transmission | 0.04 perms | ASTM E-96 |
| Usage time* | 30 minutes | - |
| Rainproof after* | 2 hours | - |
| Solid to walk on after* | 24 hours | - |
| Solid to drive on with air rubber tires after* | 48 hours | - |
| Surfacing to be applied between* | 16-48 hours | - |
| Overburden may be applied after | 2 days | - |
| Completely hardened after | 3 days | - |
| Crack spanning | 2mm/0.08 inch | - |
| Resistance to temperatures up to (short term) | 250°C/482°F | - |
| *all times are approximate and depend upon air flow, humidity and temperature. | | |

2.3 FLASHINGS

- A. Membrane Flashings: A composite of the same resin material as field membrane with 165 g/m² fleece reinforcement.

2.4 SUBSTRATE PRIMERS AND RESIN ADDITIVES

- A. Polyurethane Primer: Two-component, solvent-free polyurethane resin for use in improving adhesion of membrane to wood, metal and bituminous substrate surfaces, as provided by the following manufacturer or approved equal:
 - 1. Kemper System America, Inc.'s Kempertec D primer.
- B. Epoxy Primer: Two-component, solvent-free epoxy resin for use in improving adhesion of membrane to cementitious/masonry substrate surfaces, as provided by the following manufacturer or approved equal:
 - 1. Kemper System America, Inc.'s Kempertec EP/EP5 primer.
- C. Cold Weather Additive: Additive specifically designed to accelerate the resin reaction time at ambient temperatures below 50°F (10°C). Accelerator to be used with cream resin Component A prior to mixing of multi-component resin, as provided by the following manufacturer or approved equal:
 - 1. Kemper System America Inc.'s Kemperol A 2K-PUR Accelerator.

2.5 COATING

- A. Aggregate Finish Bonding Resin: Two-component polyurethane-based coating suitable for bonding aggregate, as provided by the following Manufacturer:
 - 1. Kemper System America, Inc.'s Kemperol 2K-PUR Resin (without fleece)
- B. Color Coating: Single-component, water-borne acrylic-based coating suitable for use as a colored coating, as provided by the following Manufacturer:
 - 1. Kemper System America, Inc.'s Kemperdur BSF-R Finish (Cool White)
- C. Color Coating: Polyurethane-based coating suitable for use as a colored coating, as provided by the following Manufacturer:
 - 1. Kemper System America, Inc.'s Kemperdur Deko 2KS-FR Finish

2.6 ACCESSORIES

- A. Application Tools, Accessories, and Cleaners: Supplied and/or approved by membrane manufacturer for product installation.
- B. Solvent-Based Cleaner for Tools and Membrane Tie-Ins: Methyl Ethyl Ketone (MEK) or acetone.
- C. Water-Based Cleaner for Membrane: Simple Green HD.
- D. Topcoat Surfacing Aggregate: Silica sand, ceramic-coated quartz, or specialty aggregate shall be washed, kiln-dried, and dust-free with the following size specification:

| | |
|----------------------------------|--------------|
| 1. Utility/Fire Rating: | 0.5 - 1.2 mm |
| 2. Alkalinity/Adhesion Key: | 0.5 - 1.2 mm |
| 3. Aesthetic/Pedestrian Traffic: | 0.4 - 1.0 mm |
| 4. Light Vehicular Traffic: | 0.5 - 1.2 mm |
| 5. Heavy Vehicular Traffic: | 0.8 - 1.5 mm |
- E. Leveling and Patching Aggregate: Silica sand shall be washed, kiln-dried, and dust-free, suitable for troweling or pourable self-leveling, round grain or angular with the following size specification:

| | |
|-------------------------------------|--------------------|
| 1. For voids less than 1" in depth: | #00 (0.3 - 0.6 mm) |
| 2. For voids 1" to 2" in depth: | #0 (0.5 - 1.2 mm) |

 Mixing Proportions shall be a ratio of resin to sand at 1:2 by volume for leveling, 1:4 by volume for patching, or as approved by membrane manufacturer.
- F. Backer Rod: Expanded, closed-cell polyethylene foam designed for use with cold-applied joint sealant.
- G. Caulking: Single component, non-sag elastomeric polyurethane sealant meeting ASTM C920, Type S, Grade NS, Class 35 for use in sealing cracks and joints, and making watertight

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seals where required.

- H. Walkway Pads: 24 x 24 asphalt impregnated mineral boards with granular surfaces by roofing manufacturer, approved for use with roofing system.

2.7 INSULATION COVER BOARD

- A. Cementitious Cover Board (Permabase): High compressive strength underlayment board consisting of aggregated portland cement slurry with polymer-coated glass-fiber mesh, with the following characteristics:

1. Board Weight 2.5 lb/sq. ft
2. Board Size 48 inches
3. Board Thickness 1/2 inch
4. Thermal Conductivity R-value of 0.39 as determined by ASTM C518
5. Board Edges square

2.8 RIGID INSULATION

- A. Polyisocyanurate Insulation with Nonasphaltic Facers: With nonasphaltic facers meeting or exceeding the requirements for ASTM C1289-06, Type II, Class 1, Grade 2 (20 psi), 1.5 inch minimum thickness, with the following characteristics:

1. Board Density 2.0 lb/cu ft
2. Board Size 48x96 inches
3. Board Thickness 3.5 inches
4. Total Thermal Conductivity K factor of 0.05 as determined by ASTM C177, aged 12 months at 75 degrees F
5. Board Edges square

- B. Tapered Polyisocyanurate Insulation with Nonasphaltic Facers: With nonasphaltic facers meeting or exceeding the requirements for ASTM C1289-06, Type II, Class 1, Grade 2 (20 psi), 1.0 inch minimum thickness, with the following characteristics:

1. Board Density 2.0 lb/cu ft
2. Board Size 48x48 inches
3. Board Taper 1/8 inch per foot
4. Total Thickness As required
5. Board Edges square
6. Slope .5 inch per foot, in areas around drains
.25 inch per foot, in areas where diversion of water migration is required
.125 inch per foot, in areas where roof deck is flat or level

2.9 INSULATION AND COVER BOARD SECUREMENT

- A. Polyurethane Adhesive: FM-approved single component moisture-cured, or two component reactive-cured polyurethane adhesive. Adhesive application rate shall be in accordance with specified wind uplift rating for system application. Roofing adhesive shall be a type approved by membrane and insulation manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck/substrate openings, curbs, and protrusions through deck/substrate, wood cant

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strips and reglets are in place and solidly set.

C. Verify deck/substrate is structurally supported, secure and sound.

3.2

PREPARATION OF SUBSTRATE

A. General: Surfaces to be prepared as a substrate for the new waterproofing system as follows:

1. The contractor shall determine the condition of the existing structural deck/substrate. All defects in the deck or substrate shall be corrected before new waterproofing work commences. Areas of deteriorated deck/substrate, porous or other affected materials must be removed and replaced with new to match existing.
2. Prepare flashing substrates as required for application of new waterproofing membrane flashings.
3. Inspect substrates, and correct defects before application of new waterproofing. Fill all surface voids greater than 1/8 inch wide with an acceptable fill material.
4. Remove all ponded water, snow, frost and/or ice from the work substrate prior to installing new waterproofing materials.
5. The final substrate for waterproofing shall be clean, dry, free of loose, spalled or weak material including coatings, mineral aggregate, and flood coat/gravel surfacing, oil, grease, contaminants, abrupt changes in level, waterproofing agents, curing compounds, and free of projections which could damage membrane materials.

B. Structural Concrete:

1. New concrete shall have cured a minimum of 28 days in accordance with ACI-308, or as approved by Waterproofing Manufacturer's Technical Department.
2. New or existing concrete shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, bituminous products and previous waterproofing materials.
3. New or existing concrete shall be dry with a maximum moisture content of five (5) percent. Determinations of moisture content shall be performed by the Contractor. Contractor shall be responsible to perform periodic evaluations of moisture content during the work. Moisture evaluation results shall be submitted in writing to the COMMISSIONER and Waterproofing manufacturer for acceptance.
4. Where required, concrete shall be abrasively cleaned in accordance with ASTM D4259 to provide a sound substrate free from laitance. Achieve an open concrete surface in accordance with ICRI surface profiles CSP 3-5. When using mechanical methods to remove existing waterproofing products or surface deterioration, the surface profile is not to exceed 1/4 inch (peak to valley).
5. The substrate shall be sound and all spalls, voids and blow holes on vertical or horizontal surfaces must be repaired prior to placement of the primer coat. Spalls and other deterioration shall be repaired in accordance with the requirements of the COMMISSIONER and Membrane manufacturer.
6. Areas of minor surface deterioration of 0.25" (6 mm) or greater in depth shall be repaired to prevent possible pooling of the liquid applied materials, leading to excessive usage of primer and resin.
7. Hollow-core panels, T-panels, and Twin-T panels shall have grouted joints between panels and shall be provided with mechanical securement from panel to panel.
8. For concrete materials with a compressive strength of less than 3,000 psi contact Waterproofing Manufacturer's Technical Department for substrate preparation requirements.

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- C. Masonry:
1. New walls shall be built with hard kiln dried brick or waterproof concrete block construction.
 2. Areas of soft or scaling brick or concrete, faulty mortar joints, or walls with broken, damaged or leaking coping shall be repaired in accordance with the requirements of the COMMISSIONER and Flashing Membrane Manufacturer.
- D. Steel/Metal:
1. Clean and prepare metal surfaces to near white metal in accordance with SSPC - SP3 (power tool clean) or as required by membrane manufacturer. Extend preparation a minimum of one (1) inch beyond the termination of the membrane flashing materials.
 2. In addition to cleaning, all metal surfaces shall be abraded to provide a rough open surface. A wire brush finish is not acceptable.
- E. Wood/Plywood:
1. Plywood shall be identified with American Plywood Association (APA) grade trade marks and shall meet the requirements of product standard PS1. Strip plywood joints with four inch (4") wide strip of flashing membrane. Cover knot holes or cracks with strips of flashing membrane.
- F. Other Flashing Surfaces:
1. Remove all contaminants as required by membrane manufacturer. Surface preparation shall be performed by means approved by COMMISSIONER.
- G. Finish Leveling, Patching and Crack Preparation:
1. General: epoxy primer/sand mix is the preferred material for all concrete and masonry substrate finish leveling, crack and wall/deck preparation and patching. Epoxy primer/sand patching mix provides a set time of approximately twelve (12) hours and does not require surface grinding. Kemperol primer/sand mix is typically applied in conjunction with general surface priming.
 2. Concrete and Masonry Substrate Leveling & Patching: Substrate conditions are to be evaluated by the Contractor, the Owner, or his designated Representative, and Membrane manufacturer. Perform leveling and patching operations as follows:
 - a) Level uneven surfaces with a leveling mixture of primer and approved kiln-dried silica sand in a 1:2 primer to sand ratio by volume. Spread and plane this compound with a squeegee and trowel to achieve a flat surface.
 - b) Fill cavities with a patching mixture of primer and approved kiln-dried sand in a 1:4 primer to sand ratio by volume.
 - c) Silica sand must be kept absolutely dry during storage and handling.
 - d) Any surface to be leveled or filled must first be primed with an appropriate primer.
 3. Joint and Crack Preparation: Joints, cracks and fractures in the structural deck/substrate shall be prepared as defined below prior to installation of the waterproofing membrane. Note: Joints, cracks, and fractures may telegraph through the waterproofing membrane.

- a) **Non-Moving Cracks, Joints, and Voids:** Determine that crack/joint is non-moving. Clean out crack/joint by brushing and oil-free compressed air. Fill crack/joint with polyurethane sealant. Voids require the installation of backer rod or other backing material prior to application of the polyurethane sealant. Allow for a minimum of twelve (12) hours cure or as required by sealant Manufacturer.
- b) **Moving Cracks:** Determine that crack is moving. Clean out crack by brushing and oil-free compressed air. Fill crack with polyurethane sealant. Allow for a minimum of twelve (12) hours cure or as required by sealant Manufacturer. Following full curing of primer, apply waterproofing resin and 4 inch (10 cm) wide strip of membrane (resin and fleece) in strict accordance with Membrane manufacturer's written instructions.

3.3 INSULATION/COVER BOARD INSTALLATION

- A. **General:** Insulation and cover board shall be installed in accordance with the insulation/cover board manufacturer's current published specifications and recommendations for use with adhered roofing. **Tapered Insulation:** Place the constant thickness first layer and the tapered thickness insulation to the required slope pattern in accordance with insulation manufacturer's instructions.
- B. **Install Insulation/Cover Board:** Install only as much insulation and cover board as can be primed, sealed, and protected before the end of the day's work or before the onset of inclement weather.
- C. **Fit Insulation/Cover Board:** Neatly fit insulation/cover board to all penetrations, projections, and nailers. Insulation shall be loosely butted, with gaps not greater than 1/4". All gaps greater than 1/4" shall be filled with acceptable insulation. Cover board shall be loosely butted, with gaps not greater than 1/4". All gaps greater than 1/8" shall be filled with primer; all gaps greater than 1/4" shall be filled with polyurethane sealant.
- D. **Strip In Insulation/Cover Board Joints:** Strip all insulation/cover board joints with four inch (4") wide strip of flashing membrane. Under no circumstances shall the membrane be left unsupported over a space greater than 1/4".
Tapered Insulation: Place the constant thickness first layer and the tapered thickness insulation to the required slope pattern in accordance with insulation manufacturer's instructions.
- E. **Stagger Insulation/Cover Board Joints:** When installing multiple layers of insulation, all joints between succeeding layers shall be staggered a minimum of 6" in each direction.
- F. **Polyurethane Adhesive Attachment:** Follow insulation/cover board and adhesive manufacturers' recommendations for the appropriate adhesive application rate and application procedure. Under normal application rate, dispense the first bead 3" inside the outside edges of the insulation/cover board to be attached, with sequential beads equidistant. Place the boards onto the roofing adhesive beads. Walk on the boards to spread the roofing adhesive for maximum contact. Periodically walk on the boards until firmly attached. Reference FM approvals for adhesive application patterns that satisfy FM wind uplift requirements. Typical application is a 3/4" bead of roofing adhesive at a rate of one lineal foot per square foot of insulation/cover board to be attached. Note: additional adhesive is required in the corner and perimeter regions of the roof. Secure insulation/cover board in accordance with approval requirements.

3.4 PRIMER APPLICATION

A. General:

1. Mix and apply single and two-component primer in strict accordance with written instructions of Membrane Manufacturer. Use only proprietary materials, as supplied by the membrane manufacturer.
2. The substrate surface must be dry, with any remaining dust or loose particles removed using clean, dry, oil-free compressed air, industrial vacuum, cloth wipe or a combination of methods.
3. Do not install primer on any substrate containing newly applied and/or active asphalt, coal-tar pitch, creosote or penta-based materials unless approved in writing by Membrane Manufacturer. Some substrates may require additional preparation before applying primer.

B. Mixing of Kempertec EP and Kempertec D Primers:

1. Premix primer Component A thoroughly with a spiral agitator or stir stick. Pour primer Component B into Component A and mix the components for approximately 2 minutes with a clean spiral agitator on slow speed or stir stick without creating any bubbles or streaks. DO NOT AERATE. The Primer solution should be a uniform color, with no light or dark streaks present.
2. Do not thin primer. Determine required primer coverage for each substrate material/condition and apply in strict accordance with written instructions of Membrane Manufacturer.
3. Mix only that amount of primer components A & B that can be used in 30 minutes.

C. Mixing of Quick-Dry Kempertec EP5 Primer:

1. Premix primer Component A thoroughly with a spiral agitator or stir stick. Pour primer Component B into Component A and mix the components for approximately 2 minutes with a clean spiral agitator on slow speed or stir stick without creating any bubbles or streaks. DO NOT AERATE. The Primer solution should be a uniform color, with no light or dark streaks present.
2. Do not thin primer. Determine required primer coverage for each substrate material/condition and apply in strict accordance with written instructions of Membrane Manufacturer.
3. Mix only that amount of primer components A & B that can be used in 20 minutes.

D. Application of Primer:

1. Roll or brush the primer evenly onto the surface to fully saturate the substrate in one application. Do not allow primer to pond or collect in low areas. Follow manufacturer's recommended application rates to ensure that a thin layer of cured primer remains on the substrate surface.
2. Apply primer only up to the edge of the membrane flashing terminations. Primer application past the membrane terminations requires surfacing with an approved material.
3. For EP/EP5 primer applications over cementitious substrates where protection from substrate wetness is required, apply primer coat at a heavier application rate until pore

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saturation is achieved.

4. For all EP/EP5 primer applications, apply kiln-dried sand into the final coat of EP/EP5 primer while still wet at the rate of 50 lbs. per 100 square feet.
 5. Allow standard primers to cure for a minimum of twelve (12) hours before membrane application. Allow quick-dry primers to cure for a minimum of four (4) hours before membrane application. Membrane must be applied to primer only when completely dry and without tack.
 6. Exposure of the primer in excess of eight (8) days or premature exposure to moisture may require removal and application of new primer. DO NOT apply new primer over exposed primer older than eight (8) days, primer prematurely exposed to moisture, or primer used as temporary waterproofing, unless approved in writing by the Membrane Manufacturer.
- E. Disposal of Primer:
1. Cured primer may be disposed of in standard landfills. This is accomplished by thoroughly mixing all components.
 2. Uncured primer is considered a hazardous material and must be handled as such, in accordance with local, state and federal regulation. Do not through uncured resin away.

3.5 MEMBRANE APPLICATION

A. General:

1. It is recommended to apply the waterproofing membrane immediately following full curing of the primer in order to obtain the best bond between primer and membrane.
2. Mix and apply cold fluid-applied reinforced polyurethane waterproofing membrane in strict accordance with written instructions of Membrane Manufacturer. Use only proprietary membrane resins and materials, as supplied by the membrane manufacturer.
3. The primed substrate surface shall be dry, with any remaining dust or loose particles removed using clean, dry, oil-free compressed air, industrial vacuum, cloth-wipe or a combination.
4. Protect all areas where membrane has been installed. Do not work off installed membrane during application of remaining work before forty-eight (48) hours of curing. Movement of materials and equipment across installed membrane is not acceptable. If movement is necessary, provide complete protection of affected areas.
5. Closely follow the Membrane Manufacturer's recommendation for hot and cold weather application. Monitor surface and ambient temperatures, including the effects of wind chill.

B. Mixing of Kemperol 2K-PUR Resin:

1. Mix resin Component A (cream formulation) with a spiral agitator until the liquid is a uniform cream color. If the ambient temperature is below 50°F (10°C), then a weather

related additive should be combined and mixed into the Component A.

- a) Accelerator should be added to resin Component A when the ambient temperature is 50°F (10°C) and below. The accelerator should be mixed with the spiral agitator for 2 minutes or until both liquids are thoroughly blended.
 2. Pour resin Component B into Component A at a 4:1 ratio (by weight) and thoroughly mix the components with a clean spiral agitator. The Resin solution should be a uniform color, with no light or dark streaks present.
 3. Mix only that amount of resin components A & B that can be used in 30 minutes.
- C. Application of Resin/Fleece:
1. Apply mixed resin to the prepared surface at the manufacturer's recommended application rate. The resin should be rolled or brushed liberally and evenly onto the surface using a broad, even stroke. Cover one working area at a time, between 15 – 20 ft.² (1.4 – 1.9 m²).
 2. Roll out dry polyester fleece onto the liquid resin mix, making sure the SMOOTH SIDE IS FACING UP (natural unrolling procedure), avoiding any folds and wrinkles. The fleece will begin to rapidly saturate with the liquid resin mix. Use a medium nap roller or brush to work the resin into the fleece, saturating from the bottom up, and eliminating air bubbles, wrinkles, etc. The appearance of the saturated fleece should be light opaque amber with no white spots. White spots are indications of unsaturated fleece or lack of adhesion. It is important to correct these faults before the resin cures.
 3. Apply additional liquid resin mix on top of fleece at the manufacturer's recommended application rate to finish the saturation of the fleece. Roll this final coating into the fleece, which will result in a glossy appearance. The fleece can only hold so much resin and all excess should be rolled forward to the unsaturated fleece, eliminating ponding or excessive build-up of the resin. The correct amount of resin will leave no whiteness in fleece and there will be a slightly fibrous surface texture. The final resin coating should be smooth and uniform.
 4. Approximately 2/3 of the total resin should be applied to the substrate below the fleece reinforcement, and 1/3 of the total resin should be applied over the fleece reinforcement.
 5. Prevent contact between mixed/unmixed resin and new/existing membrane. If any unmixed resin contacts membrane surface remove immediately and clean thoroughly with a cloth rag.
 6. At all fleece seams, allow a 2" (5 cm) overlap for all side joints and a 4" (10 cm) overlap for all end joints.
 7. At membrane tie-offs, clean in-place membrane with MEK (methyl ethyl ketone) solvent or acetone once resin has cured. Allow solvents to fully evaporate before application of new resin.
- D. Disposal of Resin:
1. Cured resin may be disposed of in standard landfills. This is accomplished by

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thoroughly mixing all components.

2. Uncured resin is considered a hazardous material and must be handled as such, in accordance with local, state and federal regulation. Do not throw uncured resin away.

3.6 FLASHING APPLICATION

A. General:

1. Install flashing system in accordance with the requirements/recommendations of the Membrane manufacturer and as depicted on standard drawings and details. Provide system with base flashing, edge flashing, penetration flashing, counter flashing, and all other flashings required for a complete watertight system.
2. Wherever possible, install the flashings before installing the field membrane to minimize foot traffic over newly installed field membrane.
3. All membrane flashings shall be installed concurrently with the waterproofing membrane as the job progresses. Temporary flashings are not allowed without prior written approval from the Membrane manufacturer. Should any water penetrate the new waterproofing membrane because of incomplete flashings, the affected area shall be removed and replaced at the contractor's expense.
4. Provide a minimum vertical height of 8" for all flashing terminations. Flashing height shall be at least as high as the potential water level that could be reached as a result of a deluging rain and/or poor slope. Do not flash over existing through-wall flashings, weep holes and overflow scuppers.
5. All flashings shall be terminated as required by the Membrane Manufacturer.
6. Alkalinity surface protection consisting of one application of EP primer and one application of approved broadcast mineral aggregate surfacing shall be applied wherever stone, concrete, or masonry elements will be placed directly over the flashing.

B. Metal Flashing – General:

1. Metal flashings shall be fabricated in accordance with the current recommendations of SMACNA and in accordance with standard drawings and project details.
2. Metal flashing flanges to which membrane is to be bonded shall be a minimum of four (4) inches in width, and secured to the substrate or wood nailers six (6) inches on center staggered with fasteners appropriate to the substrate type. The flanges shall be provided with a roughened surface that has been cleaned of all oil and other residue.
3. Metal edges that will be overlaid with membrane shall be provided with a 1/4" min. hemmed edge.
4. Apply primer, resin and fleece to metal flange, extending membrane to outside face of metal edging, and to vertical face of metal base/curb flashing.

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C. Membrane Flashing – General:

1. Membrane flashings shall be fabricated with primer appropriate for the substrate surface, resin of the same base chemical type as the field membrane, and fleece of the same weight as the field membrane unless specified otherwise.
2. Primer, resin, and fleece mixing and application methods as specified for field membranes are also suitable for membrane flashing.
3. Fleece shall overlap 2" (5 cm) minimum for all joints. Fleece shall be cut neatly to fit all flashing conditions without a buildup of multiple fleece layers. Work wet membrane with a brush or roller to eliminate blisters, openings, or lifting at corners, junctions, and transitions.

D. Pipes, Conduits, and Unusually Shaped Penetrations:

1. Flashing is typically constructed as a two part assembly consisting of a vertical wrap and a horizontal target patch. There must be a minimum of a two (2) inch (5 cm) overlap between vertical and horizontal flashing components.

E. Drains and Scuppers:

1. Connect new drains and scuppers to existing storm sewer system.
2. Alternatively, replace all broken or damaged parts of existing drains and scuppers.
3. Flashing material shall extend four (4) inches minimum onto drain or scupper flange and into drain/scupper body.
4. Install clamping ring if provided as part of the drain or scupper design. Install a strainer basket to prevent debris from clogging the drainage line.

F. Hot Stacks:

1. Protect the membrane components from direct contact with steam or heat sources when the in-service temperature exceeds 170 degrees F. In all such cases flash to an intermediate "cool" sleeve.
2. Fabricate "cool" sleeve in the form of a flanged metal cone using galvanized metal, mechanically attached to the structure or wood nailers.
3. Flashing is typically constructed as a two part assembly consisting of a vertical wrap and a horizontal target patch. There must be a minimum of a two (2) inch (5 cm) overlap between vertical and horizontal flashing components.

G. Flexible Penetrations:

1. Provide a weathertight gooseneck of round cross-section for each penetration or group of penetrations. Set in water cut-off mastic and secure to the structural substrate.
2. Acceptable gooseneck material is copper, of a sheet weight appropriate for the application.

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3. Flashing is typically constructed as a two part assembly consisting of a vertical wrap and a horizontal target patch. There must be a minimum of a two (2) inch (5 cm) overlap between vertical and horizontal flashing components.

H. Walls, Curbs and Base Flashings:

1. Wall, curb and base flashings shall be installed to solid substrate surfaces only. Adhering to gypsum-based panels, cementitious stucco, synthetic stucco, wood or metal siding, and other similar materials is not acceptable.
2. Reinforce all transition locations and other potential wear areas with a four (4) inch wide membrane strip evenly positioned over the transition prior to installing the exposed flashing layer.
3. Reinforce all inside and outside corners with a four (4) inch diameter conical piece of membrane prior to installing the exposed flashing layer.
4. All pins, dowels and other fixation elements shall be flashed separately with a vertical flashing component prior to installing the exposed flashing layer.
5. Extend flashing a minimum of four (4) inches onto the field substrate surface.

I. Drip Edges and Gravel Stops:

1. Metal drip edges and gravel stops shall be installed to solid substrate surfaces or wood nailers only. Securement to gypsum-based panels, cementitious stucco, synthetic stucco, wood or metal siding or coping, and other similar materials is not acceptable.
2. Flash all drip edges and gravel stops by extending the field membrane all the way to the edge of the exposed face prior to installing the metal edging. Strip in the metal flange with a separate 8 inch wide strip of membrane adhered to both the securement flange and to the field membrane.
3. For conditions where water infiltration behind the exposed drip edge or gravel stop face is possible, install a separate membrane layer positioned behind the face area and extending a minimum of four (4) inches past the securement flange onto the field substrate prior to installing the drip edge or gravel stop.

J. Field Fabricated Control or Expansion Joint Flashing:

1. Control or expansion joints in excess of two (2) inches in width and all expansion joints subject to vehicular traffic require the use of a separate engineered joint system.
2. Grind or otherwise bevel the inside edges of the joint opening to provide a smooth transition edge for the fleece.
3. Flashing typically consists of a fully saturated membrane bottom layer looped into the joint as a cradle, a compressible foam or rubber insert at 25% compression fitted into the joint, and a membrane top layer applied over the joint. Extend both fleece layers

four (4) inches minimum onto the field substrate on both sides of the joint.

4. Apply the field membrane over the entire joint area.

K. Electrical Conduit, Gas Lines and Lightning Protection

1. Supports for electrical conduit and gas lines greater than one (1) inch in diameter require the use of a separate engineered support system.
2. Supports for electrical conduit and gas lines one (1) inch or less in diameter, and bases for lightning protection rods and cable, can be adhered directly to the membrane surface with a single-component, high quality polyurethane sealant.

3.8 MEMBRANE PREPARATION FOR SURFACINGS AND COATINGS

- A. Membrane must be clean and dry, and free of all contaminants that may interfere with the adhesion of the surfacing and coating to the membrane surface.
- B. Membrane exposed less than 48 hours prior to application of surfacing and coating materials does not require special surface preparation. It is highly recommended that all surfacing and coating materials be applied to the membrane surface within 48 hours.
- C. Membrane exposed longer than 48 hours will require sanding/scuffing of the surface to remove the hard gloss finish, followed by an MEK or acetone solvent wipe.

3.9 SURFACING AND FINISHES

A. Aggregate Finish Surfacing

1. Provide approved kiln-dried silica sand, or other approved mineral surfacing to achieve an aesthetic and/or non-skid surface.
2. Pre-mix single-component and two-component coatings prior to application to achieve an even consistency.
3. Broadcast specified and approved sand or aggregate in excess into a bonding coat application of Membrane Manufacturer's approved urethane-based or acrylic-based aggregate coating system applied over clean, cured membrane at the manufacturer's recommended application rate. Aggregate shall be applied to excess to obtain uniform and full coverage.
4. Following minimum 24 hour cure time remove loose/un-embedded mineral aggregate by blowing with oil-free compressed air or with a vacuum. Re-broadcast clean mineral aggregate as required to provide full embedment and coverage of membrane.
5. Seal aggregate surface with a sealing coat application of Membrane Manufacturer's approved aggregate coating, applied at the manufacturer's recommended application rate. After completion of surfacing, avoid any traffic for a minimum of three (3) days to allow for surfacing to cure.

B. Coating-Type Finish Surfacing

1. Where specified, provide and install Membrane Manufacturer's approved urethane-based or acrylic-based coating applied over clean, fully cured membrane at the manufacturer's recommended application rate.
2. Pre-mix single-component and two-component coatings prior to application to achieve an even consistency and color. Mix thoroughly for approximately 2 minutes with a clean spiral agitator or stir stick without creating any bubbles or streaks. DO NOT

AERATE.

3. Apply coating at the manufacturer's recommended application rate. Two coating applications are recommended for best coverage and appearance. After completion of coating, avoid any traffic for a minimum of two (2) days to allow for surfacing to cure

C. Alkalinity Protection

1. Where placement of concrete, mortar or adhesive setting beds are required over sections of the waterproofing membrane or flashing, apply manufacturer's epoxy primer/coating at the manufacturer's recommended coverage rate, with broadcast to excess of kiln-dried silica sand into wet primer/coating.
2. Protection shall extend a minimum of one (1) foot (0.3m) past the concrete form on all sides.
3. Provide continuous cleaning with water and brush to eliminate settlement of concrete residues on in-place waterproofing membrane adjacent to area of concrete placement.

D. Walkway Pads

1. Walkway Pads: Asphalt impregnated mineral boards with granular surfaces 24x24.

E. Cants

1. Fiber Cant and Tapered Edge Strips; Asphalt impregnated wood fiberboard, preformed to 45 degree angle.

3.10 TEMPORARY CLOSURES & WATERSTOPS

- A. Contractor shall be responsible to ensure that moisture does not damage any completed section of the new waterproofing system. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition. All temporary closures shall be made as recommended or required by the membrane manufacturer.

3.11 PROTECTION

- A. Upon completion of waterproofing and flashings (including all associated work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. Protect all areas where membrane has been installed.

3.12 FLOOD TEST

- A. A flood test of the completed membrane and flashing system shall be conducted prior to the installation of any overburden/surfacing. The flood test shall be of a 24 hr. minimum duration, and shall apply a water head of 2" over the entire application area. Any incidents of water entry shall be evaluated and all necessary repairs conducted, followed by an additional flood test.

3.13 CLOSEOUT

A. Correction of Work:

1. Work that does not conform to specified requirements including tolerances, slopes, and finishes shall be corrected and/or replaced. Any deficiencies of membrane application, termination and/or protection as noted during the Membrane Manufacturer's inspections shall be corrected and/or replaced at Contractor's expense.

B. Clean-Up:

1. Site clean-up, including both interior and exterior building areas that have been affected by construction, shall be restored to preconstruction condition.

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SECTION 07700
ROOF SPECIALTIES

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 is not necessarily limited to the following:
 - 1. Parapet Coping.
 - 2. Gravel stop.
 - 3. Metal Fascia.
 - 4. Expanded Metal Mesh.
 - 5. Metal Flashing

1.3 SUBMITTALS

- A. Submit product literature, samples and shop drawings [showing profiles and anchoring devices] for approval prior to manufacture or installation (see section 07420 for additional fascia, gravel stop and coping requirements).

1.4 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 PARAPET COPING

- A. Material: See Section 07420.
- B. Provide shop-fabricated mitered and welded corner units.
- C. Provide splice plate with sealant joints or approved equal.

2.2 GRAVEL STOP

- A. Material: See Section 07420.
- B. Provide shop-fabricated mitered and welded corner units.
- C. For gravel stops, provide concealed anchors and hold down clips 24" o.c.

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- D. Provide splice plate with sealant joints

2.3 METAL FASCIA

- A. Material: See Section 07420.
- B. Provide splice plate with sealant joints

2.4 MATERIALS FOR WALL FLASHING FABRICATION

- A. Stainless steel Sheet: Dead soft fully annealed stainless steel sheet, ASTM A240, Type 316, sulfur content .005 or less, 2D dull finish.

2.5 EXPANDED METAL MESH

- A. Galvanized hot-dipped, 1 1/2 #10 standard, 80% open

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 07720
ROOF ACCESSORIES

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide all roof accessories as indicated on the Drawings and as specified herein, including, but not limited to, the following:
 - 1. Roof Hatch

1.2 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. Underwriters Laboratories, Inc. (UL).
- C. New York City Board of Standards and Appeals (BSA, or New York City Materials Equipment Acceptance (MEA).
- D. Occupational Safety and Health Administration (OSHA).

1.3 SUBMITTALS

- A. Shop Drawings: Show relationship with adjoining Work and anchorage methods. Include plans, sections, and details.
- B. Product Data: Manufacturer's catalog sheets, specifications, and installation instructions for roof hatch.
- C. Contract Closeout Submittals: Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the COMMISSIONER.
- D. Warranties

1.4 QUALITY ASSURANCE

- A. Manufacturer: Minimum of three years experience in the manufacture of products of type specified.
- B. Installer: Minimum of three years experience in the installation of products of type specified.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle the products of this Section as recommended by the Manufacturer, to protect from damage.

1.6 SEQUENCING AND SCHEDULING

- A. Coordinate installation of roof accessories with roofing and flashing.

1.7 MAINTENANCE

- A. Spare Parts: Furnish three spare 160°F fusible links for each roof vent with such device.

1.8 WARRANTIES

- A. Roof hatch shall be furnished with the manufacturer's standard 5 year warranty.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

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- A. Babcock-Davis Hatchways, Inc., Arlington, MA
- B. Bilco Co., New Haven, CT
- C. Karp Associates, Inc., NY

2.2 ROOF HATCHES

- A. Type: Aluminum units consisting of an insulated and weather stripped hinged cover on an insulated curb fitted with integral cap flashing and safety railing to match existing size. Height above finished roofing shall be equal to or greater than existing – coordinate with roofing insulation layout. Replace existing roof access ladder to match existing for hatch new curb height.
 - 1. Cover: 11 gage, mill finish aluminum with 3" beaded or hemmed flange, 1" thick fiberglass insulation covered by a 18 gage aluminum liner, and neoprene or closed cell rubber gasket seal around perimeter. Cover shall open to 90 degrees.
 - 2. Curb: 11 gage minimum, mill finish aluminum with 3½ " flange at bottom with holes for securing to roof deck, 11 gage aluminum cap flashing at top, and 1" thick rigid fiberboard insulation on exterior of curb.
 - a. Curb height shall be as required to provide a dimension of at least 6" from top of roof surfacing (gravel, pavers, etc.) to bottom of integral cap flashing.
 - 3. Fabrication: Continuously weld metal joints.
 - 4. Hardware: Zinc or cadmium plated steel; heavy pintel hinges, enclosed spring operators, positive snap latch with turn handles inside and outside, padlock hasp inside, and automatic hold-open operating arm with one hand grip release handle.
 - 5. Safety railing: Conform to OSHA Standard CFR 29 1910.23 Fall Protection in General Industry, and local regulations. Hatch manufacturer's railing system, with chain or gate on access side. Rail system shall be supported from hatch assembly without penetrating roofing. Provide weatherproof label: "NO HOISTING". Provide corrosion resistant materials throughout.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install roof accessories in accordance with the manufacturer's instructions, unless shown otherwise on the Drawings. Securely anchor units in place to the substrate by bolting, screwing or welding.
- B. Where mounting flanges are set directly in the roofing, embed the flanges in roofing cement or other waterproof mastic or adhesive as recommended by the manufacturer of the roofing. On sloping surfaces, integrate mounting flanges with roofing elements to properly shed water.

END OF SECTION

SECTION 07900
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 is not necessarily limited to the following:
 - 1. Flashing reglets and retainers.
 - 2. Coping joints.
 - 3. Exterior wall joints not specified to be sealed in other Sections of work.
 - 4. Interior wall joints not specified to be sealed in other Sections of work.
 - 5. Control and expansion joints in walls.
 - 6. Joints at wall penetrations.
 - 7. Joints between items of equipment and other construction.
 - 8. All other joints required to be sealed to provide a positive barrier against penetration of air and moisture.

1.3 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.

1.4 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 1.8 herein.

1.5 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 COMMISSIONER 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.

1.6 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.

1.7 TESTING

- A. Perform adhesion tests in accordance with ASTM C794 noting any modifications to this test procedure where compatibility is an issue.
- B. Perform testing 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 COMMISSIONER and he has given his written approval to proceed with the work.

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 two (2) years.
- B. 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 silicone sealant equal to No. 790 or 795 made by Dow Corning, "Silpruf" made by G.E. or 890/895 made by Pecora or "Spectrum 2" made by Tremco conforming to ASTM C920, Type S, grade NS, Class 25, and conforming to the following minimum standards in excess of ASTM C920.

| Test Method | C-290 Limits | Required Limits | ASTM Test Methods |
|---------------------------------------|--------------|-----------------|-------------------|
| 1. Instantaneous Shore A, non-traffic | | | |
| (a) after initial cure | 25-50 | 15-40 | C661 |
| (b) after 6 weeks @ 158° F. | None | 15-40 | C661 |
| 2. Instantaneous Shore A, traffic | | | |
| (a) after initial cure | 25-60 | 25-45 | C661 |
| (b) after 6 weeks @ 158° F. | None | 25-45 | C661 |

| | | | |
|---|-------------------|-------------------|-------|
| 3. % weight loss after heat aging | | | |
| (a) after 3 weeks @ 158° F. | 10% | | C792 |
| (b) after 6 weeks @ 158° F. | None | 6% | C792 |
| 4. Bond and cohesion area of failure | | | |
| (a) after initial cure plus 7 days in water | 9 cm ² | | C 719 |
| (b) after initial cure plus 14 days in water | None | 9 cm ² | C 719 |
| (c) after initial cure, plus 3 weeks @ 158° F , plus 2 weeks in water | None | 9 cm ² | C 719 |
| 5. Adhesion-in-peel, lbs./inch | | | |
| (a) after initial cure plus 7 days in water | 5 | | C794 |
| (b) after initial cure plus 14 days in water | None | 5 | C794 |

- B. Interior Wall Sealant: Provide a one (1) part acrylic based sealant conforming to ASTM C834, equal to "AC-20+ Silicone"™ made by Pecora or equal made by Tremco.
- C. Colors: Custom colors of sealants as selected by the COMMISSIONER.

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.

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- 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 instruction.

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. 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. COMMISSIONER 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 COMMISSIONER.
3. Accepted control section shall be standard to which all other sealant work must conform.

- B. Supervision: The Contractor shall submit to the COMMISSIONER 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.

- C. 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.

D. 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 5/8" wide, sealant depth shall be one half the joint width. 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. 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 07910
MISCELLANEOUS JOINT FILLERS

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 miscellaneous joint fillers as shown on the drawings and/or specified herein, including but is not necessarily limited to the following:
 - 1. Joint fillers as noted on drawings and not specified in other Sections of work.

1.3 SUBMITTALS

- A. Submit twelve (12) inch long sample of joint filler and manufacturer's product literature.

1.4 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

- A. General
 - 1. Size and Shape: Provide the sizes and shapes of units as recommended by the manufacturer for the joint size and condition shown.
 - 2. Color: Provide each concealed material in manufacturer's standard color which has the best overall performance characteristics for the application shown. Provide exposed materials in black.
 - 3. Compatibility: Before purchase of each filler or gasket material, confirm that product is compatible with the substrate, sealants, and other materials in the joint system.
 - 4. Adhesives: Pressure sensitive adhesives, compatible with each material in the joint system, may be applied (at installer's option) to one face of joint fillers and gaskets to facilitate installation and permanent anchorage.
- B. Material: 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.

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PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where miscellaneous joint fillers 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. Comply with manufacturer's instructions and recommendations for the installation of joint filler.
- B. Set units at proper depth or position in the joint to coordinate with other work, including the installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between the ends of joint filler units.
- C. Recess exposed edges or faces of gaskets and exposed joint fillers, slightly behind adjoining surfaces, so that compressed units will not protrude from the joint.

END OF SECTION

SECTION 08100
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. Trimmed openings.
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 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, core descriptions, label compliance, 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, 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.

1.4 QUALITY ASSURANCE

- A. Provide doors and frames complying with ANSI/SDI A250.8 and as herein specified.
- B. Fire Rated Assemblies

Wherever fire resistance classification is shown or scheduled for steel doors and frames, provide fire rated units that have been tested as fire door assemblies and comply with National Fire Protection Association (NFPA) Standard No. 80, are tested in accordance with NFPA 252 or UL 10B/UL 10C and UL 1784 as required by the NYC Building Code and comply with these Specifications. Identify each door and frame with metal UL, or Warnock Hersey labels indicating applicable fire class of the unit. Rivet or weld labels on the hinge edge of door and jamb rabbet of frame.

- 1. Oversize Assemblies: Whenever fire rated assemblies are larger than size limitations established by NFPA, provide manufacturer's certification that they have been constructed with materials and methods equivalent to requirements for labeled construction.
- 2. See Door Schedule in the Drawings for Label Requirements (Class) for respective openings.

C. Regulatory Requirements

Notwithstanding the requirements for fire-rated assemblies noted above, all fire-rated doors and frames shall be approved for use in New York City.

Provide evidence of acceptance by an approved testing agency. Provide permanent labels on doors and frames as required by the New York City Building Code. Labels shall be applied at the factory or where fabrication and assembly are performed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palleted, 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 COMMISSIONER; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames under cover at building site. Place units on minimum 4-inch high wood blocking. Avoid using nonvented 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.

1.6 FIELD EXAMINATION

- A. At the Site, before door installation, the COMMISSIONER reserves the right to select at random one or more doors for examination by cutting a portion of such size to reveal the construction of the particular door.

1. If the examination finds that the doors examined do not comply with requirements of the Specifications, all doors shall be removed from the Site and new doors shall be provided. Costs of examination and replacement of rejected doors shall be borne by Contractor.
2. If the examination finds that the doors do comply with the requirements of the Specifications, the cost of the examination and the cost of the replacement of the examined doors will be borne by the COMMISSIONER.

1.7 GAGE STANDARDS

- A. Gages specified are based on U.S Standard Gauge for hot rolled and cold rolled steel sheets.
- B. The allowable tolerances for steel sheet thicknesses shall be in accordance with HMMA Standards.

1.8 WARRANTY

- A. Submit warranty signed by manufacturer and installer, agreeing to replace assemblies which fail in materials, performance or workmanship within the specified warranty period.
 1. Warranty Period: 1 year from date of Substantial Completion.

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. At exterior locations provide doors and frames which have been fabricated as thermal insulating assemblies.
 1. Unless otherwise indicated, provide thermal rated assemblies with U factors of 0.24 Btu (hr./ft. 2/deg F.)
- D. 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".

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- E. Locate finish hardware as shown on final shop drawings in accordance with locations noted herein.

2.2 MANUFACTURERS

- A. Provide products manufactured by Amweld Building Products, Inc., Ceco Door Products, Pioneer Industries, or approved equal meeting these specifications.

2.3 FRAMES

A. Materials

1. Frames for exterior openings shall be made of commercial grade cold-rolled steel conforming to ASTM A366, not less than 14 ga., and shall have a hot dipped galvanized coating conforming to ASTM A924, A-60 coating.
2. Frames for interior openings shall be either commercial grade cold-rolled steel conforming to ASTM A366-68 or commercial grade hot-rolled and pickled steel conforming to ASTM A569-66T. 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 custom made welded units with integral trim, of the sizes and shapes shown on approved shop drawings. Knocked-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. Moulded 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.
4. Frames shall have corners mitered, reinforced and continuously welded full depth and width of frame; conforming to NAAMM Standard HMMA-820.
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.
7. Hardware Reinforcements
 - a. Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated mortised hardware only, in accord 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. Floor anchors shall be securely welded inside each jamb for floor anchorage.
- b. Where required, provide adjustable floor anchors, providing not less than two (2) inch height adjustment.
- c. 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 stirrup and strap type. Anchors shall be not less than sixteen (16) gauge steel or 0.156" diameter steel wire. Stirrup straps shall be not less than 2" x 10" in size, corrugated and/or perforated. 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' 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' 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. 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.
 11. 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.
 12. 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.
 13. 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.
 14. 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 accessible 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.

2.4 HOLLOW METAL DOORS

- A. Materials: Doors shall be made of commercial quality, level, cold rolled steel conforming to ASTM A366-68 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 A924, A-60 coating.

- 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. Face sheets shall be stiffened by continuous vertical formed steel sections spanning the full thickness of the interior space between door faces. These stiffeners shall be not less than twenty two (22) gauge spaced not more than six (6) inches apart and securely attached to face sheets by spot welds not more than five (5) inches o.c. Spaces between stiffeners shall be sound-deadened and thermal insulated the full height of the door with an inorganic non-combustible batt-type material.
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 sixteen (16) 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.
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 Mouldings and Stops

- a. Where specified or scheduled, doors shall be provided with hollow metal mouldings to secure glazing by others in accordance with glass opening sizes shown on drawings.
 - b. Fixed mouldings 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 space 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 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 COMMISSIONER to be fire-rated cannot qualify for appropriate labeling because of its design, size, hardware or any other reason, the COMMISSIONER 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 Handicap Codes:
 - 1. Hinges (other than gear type): Top five (5) inches from head of frame to top of hinge; bottom 10" ± 1" from finish floor to bottom of hinge; intermediate centered between top and bottom hinges.
 - 2. Unit and integral type locks and latches - thirty eight (38) inches to centerline of knob.
 - 3. Deadlocks: Sixty (60) inches to centerline of cylinder.
 - 4. Panic Hardware: Thirty eight (38) inches to centerline of cross bar.

5. Door Pulls: Forty two (42) inches to center of grip.
6. Push-Pull Bars: Forty two (42) inches to centerline of bar.
7. Push Plates: Forty eight (48) inches to centerline of plate.
8. Roller Latches: Forty five (45) inches 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. Between doors and frame, at head and jambs – 3/32".
 2. At Door Sills: Where no threshold or carpet is used - 1/4" maximum above finished floor; where threshold or carpet is used – 1/8" maximum above finished floor.
 3. Between meeting edges of pairs of doors - 1/8."
- 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 EXAMINATION

A. Verification of Conditions

Examine substrate and conditions, under which the frames are to be installed, for defects which will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install steel doors, frames, and accessories in accordance with the Drawing Details, approved Shop Drawings, and the manufacturer's printed instructions, except as otherwise indicated.

B. Frame Installations

Place frames accurately in position; plumb, align, and brace securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreader bars, leaving surfaces smooth and undamaged.

1. At in-place concrete and in-place masonry construction, place frames and secure in place with anchorage devices. Set anchorage devices opposite each anchor location, in accordance with details on approved Shop Drawings and anchorage

device manufacturer's instructions. Leave drilled holes rough, not reamed, and free from dust and debris.

- a. Anchor frames as detailed on the Drawings.
2. Place fire rated frames in accordance with NFPA Standard No. 80.
3. Provide necessary field splices in frames as detailed on approved Shop Drawings, welded and finished to match factory fabrication.
4. Extend jambs to structural floor slab and securely anchor in place.

C. Door Installation

1. Install doors accurately in their respective frames within the clearance specified in Part 2.
2. Place fire rated doors with clearances as specified in NFPA standard No. 80.

D. Drill and tap doors and frames to receive surface applied hardware.

3.3 ADJUSTING

A. Prime Coat Touch-up

Immediately after installation, sand smooth and clean rusted and damaged areas of shop prime coat and apply touch-up of original primer.

B. Final Adjustments

Check and adjust operating finish hardware items prior to final inspection. Leave work in complete and proper operating condition.

3.4 CLEANING

- A. Clean doors, frames, and accessories, leaving free of dirt and other foreign material after completion of installation.

END OF SECTION

SECTION 08214
DOORS -SPECIAL FABRICATION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide interior flush wood doors with factory applied aluminum sheet veneer, factory-finished, pre-fit and pre-machined as indicated on the Drawings and as specified herein.

1.2 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. Architectural Woodwork Institute's (AWI) Architectural Woodwork Standards (AWS) Section 9 Doors, Section 5 Finishing, Section 4 Sheet products.
2. American Society for Testing and Materials (ASTM)

1.3 SUBMITTALS

A. Product Data

1. Catalog sheets, specifications, and installation instructions for each type door specified.
2. Factory-finishing specifications.
3. Manufacturer's catalog data for each type of perforated metal panel or louver assembly to be installed in doors.

B. Shop Drawings

1. Show details, elevation, and construction for each door type, location and installation requirements for Finish Hardware (including cutouts and reinforcements), and accessory items, for each type of door indicated. Include details of core and edge construction, perforated metal panels, louvers, and trim for openings.
2. Include a Schedule of Doors using the same reference numbers for details and openings as those on Contract Drawings.

C. Samples

1. Corner sample of each door type, with panel (if any). Size 8" x 8" minimum.
2. For factory finished doors, include shop finish on samples.

D. Quality Assurance Certifications (per Par. 1.05 C.)

1.4 QUALITY ASSURANCE

- A. Manufacturer: Minimum 3 years successful experience in manufacturing the type of doors specified.
- B. Certifications: Affidavit by door manufacturer certifying that each door meets the specified requirements and standards.
- C. All interior solid core doors shall be furnished by one manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Factory Finished Doors: Deliver doors in factory applied wraps or heavy paper protective cartons. Mark doors and packaging with sufficient identification to ensure proper door location.
- B. Comply with Manufacturer's delivery, storage, and handling instructions.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements: Do not store doors within the building or install doors until after completion of cast-in-place concrete, masonry, plastering, gypsum board and tile Work, and until the humidity and temperature conditions are acceptable. Comply with Manufacturer's recommendations.

1.7 MANUFACTURER'S WARRANTY

- A. Provide written full, 1 year warranty, commencing at date of substantial completion, for replacement, rehanging and refinishing of all doors which develop defects in materials and workmanship including warping and telegraphing of core construction to face veneers.

1.8 FIELD EXAMINATION

- A. At the Site, during door installation, the COMMISSIONER reserves the right to select at random one or more doors for examination by cutting a portion of such size to reveal the construction of the particular door.
 - 1. If the examination finds that the doors examined do not comply with requirements of the Specifications, all doors shall be removed from the Site and new doors shall be provided. Costs of examination and replacement of rejected doors shall be borne by Contractor.
 - 2. If the examination finds that the doors do comply with the requirements of the Specifications, the cost of the examination and the cost of the replacement of the examined doors will be borne by the COMMISSIONER.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. SINGCORE, McCleary, WA
- B. Approved Equal

2.2 MATERIALS

- A. Constructed for performance conditions of center pivot and sliding door as shown on the drawings. Provide reinforcing as required for hardware and performance stability.

2.3 FABRICATION

- A. Interior Doors
 - 1. Door Thickness: 2"
 - 2. Face Veneer: Both door faces shall be 1/8" thick aluminum bonded to door, Natural Satin, directional-sanded satin finish (AA-M33); buff complying with AA-M20.
 - 4. Edging: plyboo natural flat grain plywood

2.4 FACTORY FINISHING, PREFITTING, AND PREPARATION FOR HARDWARE

- A. Factory Finishing: Prefinish wood doors at the factory or finishing shop.

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- B. Factory Prefitting and Premachining for Hardware: Prefit doors scheduled or indicated to receive factory finishing. Premachine these doors for hardware.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition doors to average prevailing humidity in installation area prior to hanging.
- B. Prepare doors to receive scheduled hardware. Coordinate doors with the finish hardware schedule and with the door frame shop drawings for proper location of mortise hardware.
- C. Openings: Cut and trim openings through doors in factory as indicated.

3.2 DOOR INSTALLATION

- A. Install the Work of this Section in accordance with manufacturer's printed installation instructions, except as shown on the Drawings or specified otherwise.
- B. Prefit Doors: Do not alter prefit factory finished doors.
- C. Factory Finished Doors: Field touch-up and restore finishes damaged during installation.

3.3 HARDWARE INSTALLATION

- A. Install all door hardware as specified in these documents; fit and adjust for proper working.

END OF SECTION

SECTION 08300
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. Frameless recessed panel access floor hatches.
 3. Framed flush panel access doors at masonry and tile walls.
 4. 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. Pull boxes.
 - c. Controls of mechanical and electrical items.
 - d. Masonry shafts for pipes and conduits, as required.
 - e. Pipe spaces, if required.
 - f. Equipment not otherwise accessible.

1.3 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 access required 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 COMMISSIONER's acceptance of manufacturer's standard size units which may vary slightly from sizes shown or scheduled.

1.4 SUBMITTALS

- A. Before any materials of this Section are delivered to the job site, submit complete manufacturer's literature to the COMMISSIONER. Submit plans and schedules showing size

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and location of each and every access door for COMMISSIONER's acceptance prior to installation.

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 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)
 - 1. 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.

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- H. Replace existing floor hatches at all locations, whether indicated on the drawings or not. Panels shall be equal to ACUDOR Products, Inc. FT-8080 aluminum floor hatch. Provide size required for each condition.

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 08520
ALUMINUM WINDOWS

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 windows as shown on the drawings and specified herein, including but not limited to, the following:
1. Aluminum projected-in and fixed replacement windows.
 2. Anchors, hardware and accessories.

1.3 PERFORMANCE REQUIREMENTS

- A. Windows shall conform to the "Voluntary Specification for Aluminum Prime Windows & sliding Glass Doors" as published by AAMA/NWWDA 101/I.S. 2-97 unless more stringent requirements as specified. Windows shall conform to minimum standards of F and P-HC65 of AAMA/NWWDA 101/I.S. 2-97 and the following:
1. Condensation Resistance Factor: When a 4'-0" x 6'-0" window is tested per 1502.7-81, the CRF shall not be less than 49.
 2. Thermal Transmittance (Conductive U Value): When a 4'-0" x 6'-0" window is tested per AAMA 1503.1-80, the U_c shall not exceed .63 BTU/HR/SQ.FT/F.
- B. Provide anchorage of window to building substrate to withstand pressure or suction wind loads per requirements of the New York City Building Code but not less than 30 psf.

1.4 SUBMITTALS

A. Shop Drawings

1. Shop drawings shall show in detail and fully indicate the location and the quantities of all the work, the kind, finish, size, section of each unit, overall and detail dimensions, factory and field joint locations, arrangements and details, location and detail of each piece of anchorage, flashings, supporting construction provisions for the work of others. ***Shop drawings shall indicate manufacturer acceptance of all window sizes and glass weights.***
2. Shop drawings shall show all surrounding conditions on elevations and details, including steel, concrete, exterior insulation and finish system, lintels, block, and anchorage; all correctly dimensioned.

B. Samples

1. Submit 12" long sample of extrusion with specified finish.

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2. All fasteners, straps, hardware, locks and keys, sealant, etc.
- C. Test reports verifying all performance requirements as called for in 1.4.
- D. **Submit manufacturer certification that the glass weight, thickness and dimensions are within window product performance limits. If any proposed configuration does not conform with manufacturer requirements, notify project team immediately.**

1.5 DELIVERY, STORAGE AND HANDLING

A. Protection

1. Materials shall be packed, loaded, shipped, unloaded, stored and protected in a manner which will avoid abuse, damage and defacement in accordance with the recommendations contained in the AAMA Aluminum Curtain Wall Manual #10 entitled "Care and Handling of Architectural Aluminum From Shop to Site".
2. Remove all paper type wrappings and interleavings that are wet or which could become wet when unloading materials.
3. Store inside if possible in a clean well-drained area free of dust and corrosive fumes.
4. Stack vertically or on edge so that water cannot accumulate on or within materials using wood or plastic shims between components to provide water drainage and air circulation.
5. Cover materials with tarpaulins or plastic hung on frames to provide air circulation and prevent contaminants from contacting aluminum.
6. Keep water away from stored assemblies.
7. The Contractor shall be responsible for taking the steps necessary to protect the materials from careless handling of tools, weld splatter, acids, roofing tar, solvents, abrasive cleaners, and other items that could damage window components and finish.

1.6 GUARANTEES AND WARRANTIES

A. General

1. The work included in this Section shall be fully warranted by manufacturer for performance, materials and workmanship for a period of no less than ten (10) years from the date of Substantial Completion unless otherwise noted herein.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide products manufactured by Traco, Efco, Graham Architectural Products Corp or approved equal. The following names and model numbers are those of Traco and shall establish the basis of product manufacture and performance; other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

1. Projected-in windows shall be equal to Model NX-3400 (per Traco technical services, 724-776-7000, 72" ± proposed maximum height is acceptable with limit stop) and fixed windows shall be equal to NX-3800. Manufacturer to determine mullion structural requirements and provide mullion type (if required) for applications. **All operable windows to have limit stop.** Manufacturer to verify glass does not exceed permissible weight for units.

Glass: 1" Insulated Glass Units.

Finish: Clear Anodized Aluminum.

2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by window manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000 psi ultimate tensile strength and not less than 0.062" thickness at any location for main frame and sash members. Comply with ASTM B221.
- B. Fasteners: Aluminum, non-magnetic stainless steel, or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors and other components of window units.
- C. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125" thick, reinforce interior with aluminum or non-magnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed-in splined grommet nuts.
 1. Do not use exposed fasteners except where unavoidable for application of hardware. Match finish of adjoining metal.
- D. Anchors, Clips and Window Accessories: Depending on strength and corrosion/inhibiting requirements, fabricate units of aluminum, non-magnetic stainless steel, or hot-dip zinc coated steel or iron complying with ASTM A386.
- E. Compression Glazing Strips and Weatherstripping: At manufacturer's option, provide molded neoprene gaskets complying with ASTM D2000 Designation 2BC415 to 3BC620, molded PVC gaskets complying with ASTM D2287, or molded expanded neoprene gaskets complying with ASTM C509, Grade 4.
- F. Sealant: Unless otherwise indicated for sealants required within fabricated window units, provide type recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Comply with Division 7 Sections for installation of sealants.
- G. Friction Shoes: Nylon or other non-abrasive, non-metallic, non-staining, non-corrosive durable material.
- H. Provide manufacturers standard aluminum insect screens
- I. **Provide window opening limit stops. Where applicable, set to prevent conflict with window shades.**

2.3 OPERATION AND HARDWARE

- A. Operable Windows: Manufacturer's standard operating hardware meeting ANSI standards specified herein.

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- B. Hardware: Concealed stainless steel hinges conforming to AAMA 904.1-87 to rotate vent inward on horizontal axis; white bronze strike and cam pole operated handle and custodial lock. Poles supplied by manufacturer, one per room..
- C. Weatherstrip: Sash shall be double weatherstripped using silicone treated pile conforming to AAMA 701.2, with a polypropylene center fin, and an EPDM weatherseal under the lower lift rail.

2.4 FABRICATION AND ACCESSORIES

- A. General: Provide manufacturer's standard fabrication and accessories which comply with indicated standards and are reglazable without dismantling of sash framing, except to extent more specific or more stringent requirements are indicated. Include complete system for assembly of components and anchorage of window units, and prepare sash for glazing.
- B. Coordination of Fabrication: Where possible, check actual window openings in construction work by accurate field measurement before fabrication, and show recorded measurements on final shop drawings. However, coordinate fabrication schedule with construction progress as directed by Contractor to avoid delay of work. Where necessary, proceed with fabrication without field measurements, and coordinate installation tolerances to ensure proper fit of window units.
- C. Provide water-shed members above side-hinged ventilators and at similar lines of natural water penetration.
- D. Provide means of drainage for water and condensation which may accumulate in members of window units.
- E. Weatherstripping: Provide compression-type weatherstripping at perimeter of each operating sash.
- F. Glass: Factory glaze windows; refer to Section 08800 for description.
- G. **Finish**
 - 1. **Finish for aluminum windows and components shall have a Class I clear anodic finish complying with AAAM 607.1, AA-M12C22A41.**

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine surfaces and conditions aluminum windows are to be installed and notify the COMMISSIONER of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory condition are corrected to permit proper installation of the work.
- B. Verify dimensions taken at the job site affecting the work. Bring field dimensions which are at variance to the attention of the COMMISSIONER. Obtain decision regarding corrective measures before the start of installation.
- C. Remove security screens to install new windows.

3.2 INSTALLATION

- A. Use only skilled tradesman with work done in accordance with approved Shop Drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane and erect windows and materials square and true adequately anchored to maintain positions permanently when subjected to normal thermal and building movement and specified wind loads.
- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weathertight installation at all metal-to-metal joints and intersections of frames and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
- E. Aluminum shall be insulated from direct contact with steel, masonry, concrete, or non-compatible materials by bituminous paint, zinc chromate primer, or other suitable insulation material.
- F. Reinstall security screens over new windows. Replace fasteners as required for installation.

3.3 ADJUSTING AND CLEANING

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, etc.
- B. Glass that is broken, damaged, cracked, or permanently stained shall be replaced.

END OF SECTION

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SECTION 08700
FINISH HARDWARE

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.
- B. Proprietary Item: The item specified herein is a proprietary product. The Contractor is required to provide such item from the designated manufacturer. Substitutions are not permissible and will not be approved.
 - 1. Allowance Amount: Not to Exceed \$32,000.00
 - 2. Payment: The allowance set forth above is provided to reimburse the Contractor for purchase of the proprietary item. 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.

1.2 SCOPE OF WORK

- A. The Contractor shall furnish and install all necessary labor, materials, equipment, services, tools and any other incidentals necessary for the following:
 - 1. ALL related hardware as scheduled.
 - 2. Provide all other labor and materials as may be reasonably inferred to be required to make the work of this Section complete.

1.3 REQUIREMENTS AND RESTRICTIONS

- A. Where finished shape or size of members taking hardware is such as to prevent or make unsuitable the use of the types specified, suitable types shall be furnished, having as nearly as practicable the same operation and quality as the type specified.
- B. Pack each item of hardware separately, complete with all trimmings, screws, bolts, washers etc. Clearly label, number and deliver ready for application. Provide machine bolts or screws as required. All fasteners shall be stainless steel and tamper proof.
- C. All cylinders shall be packed separately with their own keys included. Inside cylinders shall be clearly marked "control cylinder." Each cylinder and key shall be marked with its key change number.

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- D. Locks shall have beveled, rounded or rabbeted faces where required. For lock stiles that are too narrow for the backsets of locks specified, furnish special backsets.
- E. Mounting of kick plates, where specified, shall be with countersunk oval head, wood or machine screws as required, spaced not over 8 inches on center. Screws for kickplates shall have finish matching the plate.
- F. Furnish cuts, illustrating locks and latches to be provided, together with description of function and operation, all in accordance with General Conditions.
- G. Templates: when directed by the Contractor, templates covering all hardware applied to shall be furnished to the hollow metal/entrance fabricator to make proper provision in their work to receive hardware.
- H. Delivery: When requested by the Contractor, hardware required for shop application shall be delivered to factories of the fabricator at the Contractor's expense and in ample time so as not to impede progress of work.
- I. Protection: Furnish wrappings for all knobs, handles and pulls for protection of hardware until job completion.
- J. Guarantee: The Contractor shall and hereby does guarantee all hardware under this Section for a period of one (1) years from date of Certificate of Final Acceptance of the Work. The Contractor agrees to replace without additional cost items which prove defective due to improper materials, workmanship and installation.

1.4 APPROVALS AND REFERENCE STANDARDS

- A. Hardware not designated by trade name and catalog number herein is subject to specific approval by the CITY OF NEW YORK. This is in addition to the requirement of submission of catalog cuts specified above.
- B. Knobs for locksets shall be stainless steel US 32D (with wrought top and cast shank), with wrought stainless steel escutcheons, US 32D finish or as otherwise specified in the Hardware Schedule.
- C. Hinges are specified by type in accordance with Federal or ANSI A156.1 Specifications descriptive of the type required. In general, hinges of the same type shall be the product of one manufacturer and shall meet the following requirements:
 - 1. Butt Hinges shall be equipped with flat bottom tips and non-rising pins.
- D. Hardware submittals shall be certified by the manufacturer as compliant with ADA provisions.

PART 2- PRODUCTS

2.1 MATERIALS

A. Federal Specifications and all hardware shall conform to the applicable requirements of the Specifications cited, except as modified herein. Where no Federal Reference is available, description of physical characteristics is given.

1. FF-H-106a, c: Builders Hardware, for locks and door trim, ANSI A156.2
2. FF-H-111a: Builders Hardware, for shelf and miscellaneous hardware.
3. FF-H-116c,d: Builders Hardware, for hinges ANSI A156.1
4. FF-121c,d: Builders Hardware, for door closers ANSI 165.4
5. FF-111c: Builders Hardware, for floor door stops

B. Exposed surfaces of hardware shall have US Standard finish US32D (satin stainless steel) finish unless otherwise noted. Where US32D is not available, use US 26D (satin chrome) finish. Contractor shall verify compatibility of all hardware components and door type/action, including hinge frame compatibility and hinge size for door width and size.

All hardware shall be furnished with proper and compatible screws finished to match the items for which they are intended. Where stainless steel hardware is used, stainless steel screws shall be furnished.

C. Provide products manufactured as indicated or approved equal. Other manufacturers noted herein subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

1. Butts
 - a. Mont Hard
 - b. Hager
 - c. Bommer
2. Continuous Hinges
 - a. Hager
 - b. Markar
 - c. Ives
3. Locksets
 - a. Best Stanley Security Systems 9k series heavy duty cylindrical locks (single source as required by the COMMISSIONER)
4. Cylinders
 - a. Best Stanley Security Systems Mortise Locksets 40H Series (single source as required by the COMMISSIONER)
5. Exit Devices
 - a. Von Duprin
 - b. Precision
 - c. Detex
6. Door Closers
 - a. LCN
 - b. Norton
 - c. Rixson

7. Stop and Holder
 - a. Sugatsune
 - b. Architectural Builders Hardware
 - c. Rixson (Heavy-Duty 8HD Series)

8. Automatic Door Bottom
 - a. Zero International
 - b. Reese Enterprises
 - c. Pemko

- D. ALL screws used for installing hardware items, perforated metal security cover, glass stops, and other screws exposed to view (when permitted) shall have vandal resistant "pin-in-head" type heads such as: Button pin-in-socket TK23 and pin-in-torx (Tanner Bolt and Nut Co. 718-434-4500) acorn style head, pin-head Phillips (Tamper Proof Screw Co., 516-931-1616) Button Head, (Peerless Sales, 312-865-8870) or approved equal. Contractor shall deliver TWO (2) matching screw wrenches of each type head for each building plus three (3) additional wrenches to Project Super. ALL screws except "captive screws in stop" shall be installed with "Lock Tite" to inhibit movement.
- E. Unless otherwise noted, all hinges to be heavyweight ball bearing type.

PART 3- EXECUTION

3.1 INSTALLATION

- A. Provide complete installation of finish hardware items as indicated on Drawings and as specified herein.
- B. Mount hardware as recommended by respective manufacturer.
- C. Mount door (room) hardware items at heights and locations on doors and frames in accordance with "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by Door and Hardware Institute, except where specifically indicated otherwise.
- D. Set hardware items plumb and level and secure with proper fasteners.

3.2 TRAINING

- A. After delivery of, but before installation of the hardware, the General Contractor shall coordinate and schedule hardware installation training. The training will be conducted on the installation of locksets, door closers, exit devices, overhead stops and electromechanical hardware conducted by the manufacturer's representative for each of the product categories. The training shall be conducted on the job site with the installers of wood, hollow metal and aluminum doors in attendance. Any installer working with low voltage wiring of electromechanical hardware shall be in attendance.

3.3 APPLYING HARDWARE

- A. Hardware specified in this Section shall be fitted, installed and adjusted.

- B. Use screws and/or bolts furnished by the manufacturer of the hardware item and install in accordance with the manufacturer's instructions and templates and as required. Install full complement of screws and/or bolts.
- C. Self-tapping or TEK screws are not permitted except when used for continuous hinges.
- D. At completion of Project, leave hardware in perfect condition, free from stains, varnish, scratches and mars. Half-surface butts shall be bolted on doors with nuts on hinge side of doors.
- E. Card holders shall be installed on doors as indicated on Drawings with bottom of holder 5' above floor.
- F. No surface hardware, except butts and pivots, shall be installed before final coat of paint or varnish has been applied.

3.4 CLEANING AND ADJUSTING

- A. Clean hardware items thoroughly and adjust for proper operation.

3.5 KEY OPERATION AND INSPECTION

- A. Upon completion of the building and after locks have been secured in proper positions, keys belonging thereto shall be fitted and made to work freely in respective locks in the presence of the COMMISSIONER. The required number of keys for each lock, properly marked, shall be delivered to the COMMISSIONER, who will give a receipt of such delivery.

3.6 EXISTING BUILDING MODIFICATION

- A. Unless otherwise specified, new locks for interior doors shall be masterkeyed in sets as hereinafter designated and grand masterkeyed for entire building.
- B. Unless otherwise specified, all locks shall be provided with three (3) keys. Locks with double cylinders shall be provided with three sets of keys. (three keys for each cylinder). When record of existing keying is available, Keying for new locks shall be incorporated into keying system of the existing building.
- C. Where rooms have two entrances from corridor or adjoining rooms, locks for these doors shall be keyed alike.

PART 4 – SCHEDULES AND KEYING

4.1 FINISH HARDWARE SCHEDULE

- A. Provide hardware for each door, each pair of doors, and each set of doors, in compliance with "Hardware Set Numbers" indicated in Door Schedule on Drawings, and as specified herein.

Manufacturer's names and product designations for hardware types are listed for the purpose of establishing minimum requirements. Provide the product specified or comparable product of other manufacturers for each hardware type.

B. All door frames located in smoke partitions and fire-rated partitions shall be provided with continuous smoke seals at jambs and head, whether or not listed in Hardware Sets below. Manufacturer/model: Pemko S44D; McKinney S44D.3.03

C. Hardware sets:

1. BATHROOMS

- a. Lockset : BEST 40-H-Series Heavy Duty Mortise Lock
L / ANSI F19 Privacy with visual indicator thumb turn
- Lever: Style 16, rose style H; 630 finish
- b. Hinges: MONT HARD (4) STSBB1099 Stainless Steel 4 1/2" x 4 1/2"
Full Mortise Heavy Weight Hinges
- c. Closer: LCN 3130 concealed closer with hold-open track with bumper
- d. Stop: Integral with closer.
- e. Saddle: stone per section 09310

2. STAFF ROOMS

- a. Lockset : BEST 40-H-Series Heavy Duty Mortise Lock
AB / ANSI F20 Office
- Lever: Style 16, rose style H; 630 finish
- b. Hinges: MONT HARD (4) STSBB1099 Stainless Steel 4 1/2" x 4 1/2"
Full Mortise Heavy Weight Hinges
- c. Closer: LCN 3130 concealed closer with bumper
- d. Stop: Integral with closer.
- e. Saddle: stone per section 09310

3. SERVICE ROOMS

- a. Lockset : BEST 40-H-Series Heavy Duty Mortise Lock
D / ANSI F07 Storeroom
- Lever: Style 16, rose style H; 630 finish
- b. Hinges: MONT HARD (4) STSBB1099 Stainless Steel 4 1/2" x 4 1/2"
Full Mortise Heavy Weight Hinges
- c. Closer: LCN 3130 concealed closer with hold-open track with bumper

- d. Stop: Integral with closer.
- e. Saddle: stone per section 09310

For double door applications, provide dummy lever, TRIMCO 5002 Lock Astragal 6" x 1-9/16" and IVES FB41-P automatic flush bolts(top and bottom) on left (inactive) leaf + DP-2 Dust Proof Strike in head and saddle.

4. PASSAGE

- a. Lockset : BEST 40-H-Series Heavy Duty Mortise Lock
N / ANSI F07 Storeroom
Lever: Style 16, rose style H; 630 finish
- b. Hinges: MONT HARD (4) STSBB1099 Stainless Steel 4 1/2"x 4 1/2"
Full Mortise Heavy Weight Hinges
- c. Closer: LCN 3130 concealed closer with hold-open track with bumper
- d. Stop: Integral with closer.
- e. Saddle: NONE
- f. Door Bottom ZERO INTERNATIONAL #361AA heavy duty automatic door bottom

5. EXTERIOR (Hollow metal)

- a. Exit Device VON DUPRIN mortise 8875-EO
- b. Hinges: MONT HARD (4) STSBB1099 Stainless Steel 4 1/2"x 4 1/2"
Full Mortise Heavy Weight Hinges
- c. Closer: LCN 2030 concealed closer with bumper
- d. Stop: Integral with closer.
- e. Saddle Handicapped with less than 1/4" vertical rise, 6" or 7" wide by full width of jambs, fluted aluminum, model number 546A or 547A as conditions dictate, as manufactured by Zero International

6A. PAIR / ALUMINUM VESTIBULE DOORS (Interior)

Note: Hardware sets 6A and 6B reflect Brooklyn Public Library function requirement that when the facility is occupied, but not open, the inner vestibule doors can be locked allowing patrons or staff to enter the vestibule but not gain access to the facility. During patron hours, both inner and outer vestibule doors will be unlocked. During times that the facility is closed and unoccupied, the outer vestibule doors will be locked.

- a. Inactive (Left) Leaf: Vistawall FB-14 Flush (Concealed) Bolt top and bottom

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- b. Active (Right) Leaf: BEST keyed standard mortise cylinder on both sides of door.
- c. Hinges: HAGER Roton Concealed leaf heavy duty (gear) 780-224/226 HD (as required for door thickness- verify hinge use with door thickness.
- d. Closer: LCN 2030 concealed closer with bumper
- e. Stop: Integral with closer.
- f. Saddle Handicapped with less than 1/4" vertical rise, 6" or 7" wide by full width of jambs, fluted aluminum, model number 546A or 547A as conditions dictate, as manufactured by Zero International
- g. Pull: ELMES T54-01-001 full height bar attachment at head and kick with no intermediate attachment points/ Hairline stainless steel finish. EACH LEAF, EACH SIDE OF DOOR.
- h. Weatherstripping: per door manufacturer

6B. PAIR / ALUMINUM VESTIBULE DOORS (Exterior)

- a. Inactive (Left) Leaf: Vistawall FB-14 Flush (Concealed) Bolt top and bottom
- b. Active (Right) Leaf: BEST keyed standard mortise cylinder on both sides of door.
- c. Hinges: HAGER Roton Concealed leaf heavy duty (gear) 780-224/226 HD (as required for door thickness- verify hinge use with door thickness.
- d. Closer: LCN 2030 concealed closer with bumper
- e. Stop: Integral with closer.
- f. Saddle Handicapped with less than 1/4" vertical rise, 6" or 7" wide by full width of jambs, fluted aluminum, model number 546A or 547A as conditions dictate, as manufactured by Zero International
- g. Pull: ELMES T54-01-001 full height bar attachment at head and kick with no intermediate attachment points/ Hairline stainless steel finish. EACH LEAF, EACH SIDE OF DOOR.
- h. Weatherstripping: per door manufacturer

7. EXTERIOR ALUMINUM STOREFRONT DOOR

- a. Exit Device: VON DUPRIN mortise 8875EO – Provide mortise strike and hex key dogging (action shall allow daytime retraction of locking device for passage function (exterior pull provided separately)
- c. Hinges: HAGER Roton Concealed leaf heavy duty (gear) 780-224/226 HD (as required for door thickness- verify hinge use with door thickness.

- d. Closer: LCN 2030 concealed closer with bumper
- e. Stop: Integral with closer.
- f. Saddle Handicapped with less than 1/4" vertical rise, 6" or 7" wide by full width of jambs, fluted aluminum, model number 546A or 547A as conditions dictate, as manufactured by Zero International
- g. Pull: ELMES T54-01-001 full height bar attachment at head and kick with no intermediate attachment points/ Hairline stainless steel finish. PULL SIDE OF DOOR.
- h. Weatherstripping: per door manufacturer

8. INTERIOR ALUMINUM STOREFRONT DOOR

- a. Lockset : Door Manufacturer supplied cylinder –keyed exterior and interior
Lever: NONE – provide ELMS T2970 full height bar attachment at head and kick with no intermediate attachment points; each side (sized to door)
- b. Hinges: Door manufacturer provided center top pivot and center bottom pivot (for use without threshold)
- c. Closer: Door manufacturer provided center hung LCN concealed overhead closer
- d. Stop: SUGATSUNE DSD-02/L Floor Mount Type
- e. Saddle: NONE

9. SPECIAL CENTER PIVOT DOOR – 2 LEAFS (ACTIVE + INACTIVE)

- a. Lockset : ACCURATE Rabbeted kit for full mortise lock #9503ST “classroom deadlock”, key outside will project/retract deadbolt. Thumbturn inside can retract but not throw deadbolt
- b. Hinges: RIXON Model 370 Center Hung pivot - use top pivot 345 in lieu of 340 due to door height greater than 8'-6" (1 set each leaf)
- c. Closer: NONE
- d. Stop: SUGATSUNE DSD-02/L Floor Mount Type (active leaf) + DSD-02/S Floor Mount Type - provide (2) mounted to door head/ inactive leaf)
- e. Saddle: NONE
- f. Flush Bolts: IVES FB41T Automatic Top Flush Bolt (inactive leaf only) + IVES 262 Manual Bottom Flush Bolt (1 each leaf) + IVES DP1 Dust Proof Floor Strikes in open position (both leaves) and closed position (inactive leaf) –

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Drill 1" Diameter hole in aluminium header and 3/4" deep into header ground to receive top bolt.

10. SPECIAL SLIDING POCKET DOOR

- a. Lockset : NONE
- b. Track: SUGATSUNE SDR-A300TR with pocket mounted bottom guide track and door mounted roller. Mount end floor guide at closed position wall overlap.
- c. Closer: NONE
- d. Stop: Integral with track – located in positions noted on drawings.
- e. Saddle: NONE

END OF SECTION

SECTION 08800
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 the design, engineering, fabrication and installation including 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, the following:*

- 1. Miscellaneous glass units
- 2. Glazing accessories.

1.3 QUALITY ASSURANCE

- A. Wire glass shall be tested and approved by UL for fire resistance.
- B. Qualifications of Installers: Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the referenced standards and the requirements of this work, and who shall personally direct all installation performed under this Section of these specifications.

- C. Codes and Standards

- 1. Comply with all pertinent recommendations contained in the "Manual of Glazing" of the Glass Association of North America, latest edition.
- 2. Comply with requirements of ANSI Z97.1.
- 3. Comply with all NYC Building Code requirements for vertical and horizontal glass as shown on the drawings, including but not limited to 2008 NYC Building Code, 2403.4 where glazing is installed adjacent to a walking surface, the differential deflection of two adjacent unsupported edges shall not be greater than the thickness of the panels when a force of 50 pounds per linear foot (plf) (730 N/m) is applied horizontally to one panel at any point up to 42 inches (1067mm) above the walking surface) and for glass at overhead conditions.
- 4. Make modifications to specifications below as required for NYC Building Code compliance

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 .
- 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. 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; 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. Glazing for Fire-Rated Window 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 ratings indicated, based on testing according to NFPA 257.
- G. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI 97.1.
 - 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.

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H. 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 City of New York 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 City of New York 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 MANUFACTURERS

A. Provide products manufactured by Oldcastle Glass, Cardinal Glass, Goldray Industries or approved equal. The following names and model numbers are those of Oldcastle Glass and shall establish the minimum product manufacture and performance quality. Other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

2.2 GLASS - GENERAL

A. Type A Glass

1. **Vertical Insulated Glass Units** for use at Vestibule, Doors and Storefront framing shall have ¼" and ½" thick lites with a nominal 1/4" air space.
 - a. ¼" thick lite shall be tempered float glass.
 - b. ½" thick lite shall be equal to Oldcastle Glass (www.oldcastleglass.com) "ArmorProtect Forced Entry Resistant Glass"
 - c. Lites shall comply with NYC Building Code Article 12/ Subchapter 10 including, but not limited to the provisions of section 27-651 and RS 10-67, RS 10-68 and other applicable requirements. *Contractor shall provide certification from window/door manufacturer that glass weight is wholly within the allowable tolerances for application/operation.*

B. Type B Glass

1. **Vertical Insulated Glass Units** for use at windows shall have ¼" and ½" thick lites with a nominal 1/4" air space.

- a. ¼" thick lite shall be clear tempered float glass.
- b. ½" thick glass shall be Oldcastle Glass (www.oldcastleglass.com) "ArmorProtect Forced Entry Resistant Glass"
- c. Lites shall comply with NYC Building Code Article 12/ Subchapter 10 including, but not limited to the provisions of section 27-651 and RS 10-67, RS 10-68 and other applicable requirements. *Contractor shall provide certification from window manufacturer that glass weight is wholly within the allowable tolerances for application/operation.*

C. Type BP1 Glass (same as B with PRIVACY glass)

- 1. Vertical Insulated Glass Units for use at windows shall have ¼" and ½" thick lites with a nominal 1/4" air space.
 - a. ¼" thick lite shall be RAYADO Pilkington Texture privacy tempered float glass by Oldcastle Glass (www.oldcastleglass.com). Glass pattern shall be oriented vertically in frame.
 - b. ½" thick glass shall be Oldcastle Glass (www.oldcastleglass.com) "ArmorProtect Forced Entry Resistant Glass"
 - c. Lites shall comply with NYC Building Code Article 12/ Subchapter 10 including, but not limited to the provisions of section 27-651 and RS 10-67, RS 10-68 and other applicable requirements. *Contractor shall provide certification from window manufacturer that glass weight is wholly within the allowable tolerances for application/operation.*

D. Type BP2 Glass (same as B with FLUTED glass)

- 1. Vertical Insulated Glass Units for use at windows shall have ¼" and ½" thick lites with a nominal 1/4" air space.
 - a. ¼" thick lite shall be REEDED Pilkington Texture fluted tempered float glass by Oldcastle Glass (www.oldcastleglass.com). Glass pattern shall be oriented vertically in frame.
 - b. ½" thick glass shall be Oldcastle Glass (www.oldcastleglass.com) "ArmorProtect Forced Entry Resistant Glass".
 - c. Lites shall comply with NYC Building Code Article 12/ Subchapter 10 including, but not limited to the provisions of section 27-651 and RS 10-67, RS 10-68 and other applicable requirements. *Contractor shall provide certification from window manufacturer that glass weight is wholly within the allowable tolerances for application/operation.*

E. Type C Glass

- 1. Horizontal Insulated Glass Units for use at Vestibule ceiling shall have ½" inboard and ¼" thick outboard lites with a nominal 1/4" air space.
 - a. ¼" thick lite shall be tempered float glass.
 - b. ½" thick glass shall be Oldcastle Glass (www.oldcastleglass.com) "ArmorProtect Forced Entry Resistant Glass"
 - c. Lites shall comply with NYC Building Code section 27-338(d) Skylights and other applicable requirements. *Contractor shall provide certification from glass manufacturer that glass span is wholly within the allowable tolerances for product.*

F. Patron room glass

1. 5/8" thick fully tempered fixed Silicone caulked butt-glazed
- G. The contractor shall coordinate glass sizes, thickness and weights with window, door and storefront manufacturers and shall demonstrate compatibility of glass properties with frames, windows and doors prior to ordering materials.
- I. All glass shall bear the label of its manufacturer and shall demonstrate conformance in all respects, as applicable, with the requirements of NYC Building Code section 27-338(d) Skylights and NYC Building Code Article 12/Subchapter 10 Glass Panels including, but not limited to, the provisions of section 27-651 and RS 10-67. The contractor shall provide a manufacturer prepared letter attesting to this as part of the submittal package. Contractor shall also verify size, weight and spanning ability of vertical and horizontal units.
 1. Sealed Insulated Glass (IG) Units:
 - a. Provide hermetically sealed IG units with dehydrated airspace, dual sealed with a primary seal of polyisobutylene (PIB), or thermo plastic spacer (TPS) and a secondary seal of silicone or an organic sealant depending on the application.
 - b. Insulating glass units are certified through the Insulating Glass Certification Council (IGCC) to either ASTM E774, or to ASTM E2190, or both.
 2. Low-E properties:
 - a. Provide Pilkington Solar E solar control *or approved equal corresponding to the performance characteristics and quality of the product indicated* low-E glass as permitted by the requirements above.

2.2 GLAZING ACCESSORIES

- A. Silicone Sealant: One part moisture-curing silicone sealant complying with F.S. TT-S-001543, Class A; use where wet seal is required except where insulating glass seal assembly contains polysulfide sealant; at these areas use two-part polysulfide sealant conforming to F.S. TT-S-227, Class A, Type 2.
- B. Glazing Tapes: Tape shall be preformed macro-polyisobutylene with a continuous integral shim of a Shore "A" of 40-60- and complying with AAMA 807.1. Tape should compress to the shim without excessive force being required, as recommended by the glass manufacturer, to avoid pressure points or breakage.
- C. Glazing Gaskets
 1. The material shall consist of at least 50% by weight of basic rubber hydrocarbon, and shall contain no crude or reclaimed rubber. It shall be homogeneous, free from defects, and shall be compounded and cured to meet the requirements herein specified.
 2. Cured materials shall meet the properties of AAMA SG-1.
- D. Continuous Glazing Spacer Shims: The material shall consist of at least 50% by weight of basic rubber hydrocarbon, and shall contain no crude or reclaimed rubber. It shall be homogeneous, free from defects, and shall be fabricated of EPDM or neoprene with a Shore A Hardness of 50.
- E. Miscellaneous Glazing Materials

1. Setting Blocks: Neoprene or EPDM, 70 – 90 durometer hardness, having proven compatibility with sealants used.
2. Edge Blocks or Spacers: Neoprene or EPDM, 40 – 60 durometer hardness, having proven compatibility with sealants used.
3. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with sealants used. Not to be used in the glazing rabbet.
4. Cleaners, Primers and Sealers: Type recommended by manufacturers of sealant or gasket.

2.3 FABRICATION

- A. Fabricate glass lites to proper sizes and thicknesses, from measurements taken at the project.
- B. Glass lights shall have "clean cut" and/or custom factory edges conforming to manufacturer's recommendations.
- C. Manufacture tempered and insulating glass units to exact sizes for each opening. Discard, remove and replace over and/or undersize units with proper fitting glass units of same type.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where glass and glazing 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.
- B. Verify by measurements taken at the job site those dimensions affecting the work. Bring field dimensions which are at variance to the attention of the COMMISSIONER. Obtain decision regarding corrective measures before the start of installation.
- C. Verify all glass sizes and clearances.

3.2 STANDARDS & PERFORMANCE

- A. Watertight and airtight installation of each glass product is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.
- B. Protect glass from edge damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard units with significant edge damage or other imperfections.
- C. Glazing channel dimensions as shown are intended to provide for necessary bite on glass, minimum edge clearance, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.
- D. Comply with combined recommendations and technical reports by manufacturers of glass and glazing products as used in each glazing channel, and with recommendations of Flat Glass

Marketing Association "Glazing Manual", except where more stringent requirements are indicated.

- E. Install insulating glass units to comply with recommendations by Sealed insulating Glass Manufacturers Association, except as otherwise specifically indicated or recommended by glass and sealant manufacturers. Insulating glass units shall be installed in such a manner as to adequately drain the glazing rabbet as approved in writing by the Insulating Glass manufacturer.

3.3 PREPARATION FOR GLAZING

- A. All surfaces receiving glazing materials shall be thoroughly wiped with a clean cloth dampened with high performance cleaners as approved by the sealant manufacturer, such as Xylol, MEK, or manufacturer's proprietary cleaners. Wipe dry using a clean cloth, changing frequently. Special precautions must be taken in cold weather to insure the surfaces are free from frost. Apply primer to joint surfaces to receive sealant.
- B. All sashes shall be checked prior to glazing to make certain that the opening is square, plumb and secure in order that uniform face and edge clearances are maintained. Inspect all butt and miter joints. If these joints are open, they shall be sealed with Silicone Sealant prior to glazing. All ventilators shall be properly adjusted. Maintain minimum face clearance between glass and sash, on both sides, as outlined by the glass manufacturer.
- C. Glass and glass setting materials shall be compatible with each other and adequate for their intended purpose.
- D. All operating sash shall be glazed in a closed position and not opened by any trade until the glazing material has been properly cured.
- E. Protect adjoining surfaces not to receive glazing materials against staining or damage.

3.4 GLAZING

- A. Remove stops carefully so as not to damage finish, and after setting glass, replace in their original positions with the same fastening devices, and/or snap in place.
- B. Setting Blocks: Not less than four (4) inches long, by full width of glass and of a height to permit a proper glass bite as recommended by the approved glass manufacturer and/or as noted herein. Place two (2) setting blocks at the glass quarter points for each lite of glass.
- C. Provide spacers inside and out, of proper size and spacing, for glass sizes larger than fifty (50) united inches, except where gaskets or pre-shimmed tapes are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
- D. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- E. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in channel at heel of jambs and head (do not leave voids in sill channels), except as otherwise indicated and depending on lite size, thickness and type of glass, and complying with manufacturer's recommendations.
- F. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

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- G. Tool exposed surfaces of glazing liquids and compounds to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.
- H. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discolorations.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead.
- J. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in glazing system.
- K. Receive, store, distribute and install glazing materials against staining or damage.
- L. For glazing of interior lites in hollow metal frames, provide glazing tape on both sides of glass to sight line.

3.5 CURE, PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately upon installation, by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove non-permanent labels and clean surfaces. Cure sealants for high early strength and durability.
- B. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents, and vandalism.
- C. Wash and polish glass on both faces not more than four (4) days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Comply with glass product manufacturer's recommendations for final cleaning.

END OF SECTION

SECTION 08840
PLASTIC HONEYCOMB COMPOSITE 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. Plastic Honeycomb Composite Glazing Panels in Vertical Applications

1.3 SUBMITTALS

- A. Product Data: Indicate product description, fabrication information, compliance with specified performance requirements.
- B. Terms and Conditions and Three Year Warranty.
- C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- D. Samples for Initial Selection: Submit minimum 2.5 inch by 2.5 inch samples. Indicate full color and honeycomb variation.
- E. Samples for Verification: Submit minimum 4 inch by 4 inch sample for each type, facing, core pattern and color of honeycomb panel.
- F. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects – Please note visual characteristics below

- 1. Build mockup of application of Plastic Honeycomb Composite Glazing

- 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

- G. Maintenance Data: Submit Plastic Honeycomb Composite Glazing care and maintenance data, including care, repair and cleaning instructions. Include in Project close-out documents.

1.4 WARRANTY

- A. Manufacturer's Warranty on Plastic Honeycomb Composite Glazing panels: Manufacturer's standard form agreeing to repair or replace units that fail in material or workmanship within the specified warranty period.
- B. Warranty Period: 1 year after the date of substantial completion.

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- C. The warranty shall not deprive the owner of other rights or remedies the owner may have under other provisions of the contract documents, and is in addition to and runs concurrent with other warranties made by the contractor under the requirements of the contract documents. Product handling

1.5 DELIVERY, HANDLING AND STORAGE

- A. All Plastic Honeycomb Composite Glazing panels delivered on a wood skid with protective triple-wall cardboard or plywood enclosure and covered with self-adhesive protective film.
- B. Immediately upon delivery examine each crate for evidence of damage
- C. Do not deliver Plastic Honeycomb Composite Glazing panels, framing systems and/or accessories to Project site until areas are ready for installation.
- D. If delivered early, panels should remain on skids and in crates with other packing material. Store in a dry shaded area. Flat storage recommended. Do not stack other material on top of shipment.
- E. Handle materials to prevent damage to finished surfaces. Do not remove protective film until installation and project construction is complete and site is prepared for occupation.
- F. Do not install Plastic Honeycomb Composite Glazing Panels until spaces are enclosed and weatherproof.
- G. Do not force, warp or torque panels during handling or installation.
- H. Carry panels vertically and lengthwise with support on each end.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. PANELITE, Los Angeles, CA, USA
- B. DESIGN COMPOSITE, Niedernsill, Austria
- C. BENCORE, Carrara ,ITALY
- D. Approved Equal

2.2 MATERIALS

- A. EQUAL TO PANELITE BONDED SERIES panels
 - 1. Panel Thickness: 13/16"
 - 1. Core: Tubular clear
 - 2. Facings: Transparent or Satin PMMA (Acrylic), PETG and Polycarbonate as indicated below.

3. Colors/Finishes:
Public side: OT (Orange Transparent), non-public side OS (orange Satin)
4. Edging: Bonded Aluminum structural Edge Fin

2.3 FABRICATION

A. Cutting – Plastic Honeycomb Composite Glazing panels

1. For on-site cutting use of a triple-chip tooth grind, 60 tooth, carbide-tipped, thin kerf blade for cutting non-ferrous materials (eg. for cutting acrylics and other plastics).
2. Table saw and use of dust collection system is recommended. Eye protection should be worn when cutting or drilling panels.
3. See Bonded Series fabrication documentation for additional information related to cutting and handling
4. It recommended while cutting. For Plastic Honeycomb Composite Glazing, cut pieces narrower than 3" are not recommended.
5. Factory applied protective film should remain on panel during cutting and drilling and should be removed only after installation.

B. Drilling and Attachments

1. On site drilling: Plastic Honeycomb Composite Glazing panels should be secured between a wood substrate and drilling template to avoid potential damage or delaminating of facing.
2. For panels in vertical applications, a minimum of .5" clearance from edge of panel to outside edge of hole is recommended for drilling and attachments.
3. For horizontal or angled hung installations, the recommended bolting clearance will vary per application. Please inquire with a Panelite Design Consultant.
4. For bolted or screwed attachments through the panel, use of a washer is recommended.
5. Do not over-tighten when screwing or bolting through panels to avoid dimpling or damage of facing.
6. Factory applied protective film should remain on panel during cutting and drilling and should be removed only after installation.

C. Machining: Acceptable means of machining are listed below. Ensure that material is not chipped or warped by machining operations.

1. Sawing: Select equipment and blades suitable for type of cut required. Use of a jig saw is NOT recommended. Refer to cutting specifications above.
2. Drilling: Select Drills and drill bits specifically designed for use with plastic products.
3. Milling: Plastic Honeycomb Composite Glazing only, climb cut where possible.
4. Routing: Caution should be used while routing panels. Core is extremely vulnerable to damage during routing. Due to potential core damage, routed panels should be framed to hide exposed edge. Use two flute, straight carbide tipped router bit.

D. Forming:

1. FLAT panels are rigid and cannot installed in curved configurations on site.
- E. Fasteners: Appropriate fasteners vary per panel and per design. Please inquire further with Plastic Honeycomb Composite Glazing MANUFACTURER for specific requirements.
- F. Safety and Preparation
1. Eye protection should be worn when cutting or drilling panels. In high volume cutting operations face masks or respirators are recommended.
 2. Wearing work gloves is recommended. Allergic reactions to glass fibers can be avoided by the use of barrier creams on exposed skin areas.
 3. Fire safety precautions must be employed in storage and during application.

Part 3 – EXECUTION

3.1 HANDLING AND STORAGE

A. General

1. Keep the protective film in place for as long as possible, until panel installation.
2. Store in a sheltered location (warehouse) with temperatures between 40°F and 90°F, avoiding direct sunlight, exposure to rain and snow, and presence of corrosive substances and/or solvents.
3. Handling of a single panel must be done in a vertical position. Avoid rubbing between panels.
4. Horizontal storage is advised with the following recommendations
5. Keep the original factory packing intact and place it on an even and regular surface. If stored outside factory packaging, place the panels on an even and regular surface, avoiding the presence of dirt particles between panels (it is advisable to protect surfaces with a secondary protective layer between the panels).

3.2 APPLIED FRAMING FOR PLASTIC HONEYCOMB COMPOSITE GLAZING PANELS

- A. It is recommended that all edges of panels be protected, either by being built-in, or if freestanding, with the use of edge treatment. For Plastic Honeycomb Composite Glazing panels either applied U-channels, an aluminum framing system, or integral flush edge closeout are recommended. Consult Plastic Honeycomb Composite Glazing MANUFACTURER for edge treatment recommendations for specific applications.
- B. High quality heavy-duty epoxy or silicone adhesive is recommended for applied framing of Plastic Honeycomb Composite Glazing panels. The adhesive should be applied to the inside face of the framing that will be in contact with the facing and then pressed firmly onto the panel. To avoid squeeze-out onto the face of the panel, the amount of adhesive should be sufficient but not excessive, approximately a 1/8" bead. Allow for curing – 48 hours minimum. For full performance, allow 7-10 days for curing.
- C. An initial test of adhesive is recommended to determine the appropriate amount. Remove excess adhesive or sealant before it cures. Installer shall test for most appropriate method of adhesion.

This may vary according to facing material and specific application.

- D. If panels will be exposed to moisture or water, ensure a continuous seal between edge of panel and framing by applying a bead of clear silicone where the framing and panel facing meet after the framing is applied.
- E. The use of glazing suction cups should be avoided. Framing detail should be a precise fit to avoid the need for unnecessary force.

3.3 CLEANING AND MAINTENANCE

- A. Non-abrasive glass and all-purpose surface cleaners may be used (i.e. Windex, etc.)
- B. DO NOT USE ABRASIVE CLEANERS (such as Ajax, Comet, etc.) or cleaners containing phosphates.
- C. General-purpose adhesive solvent can be used to rid fiberglass and resin panels of any adhesive residue or other surface marks. Testing on an inconspicuous area of panel is recommended.
- D. Handle panels with care. Avoid direct impact to panel faces or edges.
- E. Keep panels away from permanent or excessive heat sources.

3.4 BONDED SERIES - PANEL CLEANING

- A. Edge cleaning: blow with compressed air on the edges. •
- B. Surface Cleaning: blow with compressed air and/or use an antistatic cloth wiping gently in order to avoid abrasions.
- C. Do Not:
 - 1. Use detergents others than those indicated above • _
 - 2. Use a dry cloth for dry dirt removal • _
 - 3. Clean panels under direct sunlight or high temperatures. • _
 - 4. Use abrasives, squeegees, blades, pointed tools, roto-brush systems
- D. Surface Polishing
- E. Bonded Series panel surfaces can be polished:
 - 1. to restore original gloss of surfaces damaged by scratches or abrasions due to faulty repairs
 - 2. to finish surfaces deriving from cutting/milling operations, giving them a look very similar to those of the external sheets of the panel; •
 - 3. to refine (give a final touch) after edging
 - 4. Instructions:

- i. Step 1: Removal of material up to the disappearance of processing scratches-marks.
- ii. Use a rotor-orbital polishing machine (orbit: mm) with speed regulation and rigid sanding disk diam. 150mm treating in succession the surfaces with abrasive paper grain (150, 240-360 (dry), abrasive 3M 260L P600 (dry) and abrasive 3M TRIZACT P1000 (wet)
- iii. Step 2a: Polishing (glossy surfaces), using an electronic polishing machine with speed regulation and sanding disk for sponges 3M09552 treating the surfaces either a felt 3M 0358 and universal abrasive paste 3M 09375 or orange sponge pad 3M 09550 with universal abrasive paste 3M 09375
- iv. Step 2b: Polishing matt surfaces, it is possible to carry out an opacifying treatment in alternative to polishing with a rotating orbital (orbit mm) with speed regulation, rigid sanding disk 3M 02329, with abrasive 3M TRIZACT P3000 (WET)

F. Sealing Edges

1. If panels are exposed to weather conditions or if they are placed in very humid environments (such as bathroom, saunas, etc.) edges **MUST** be sealed with acid-free silicon protecting surfaces near the edges with masking cellar tape.

G. Troubleshooting : Scratches or Tears of the Protective Film

1. If during panels transportation or successive handling the protective film is removed or altered, damage to panel surfaces can occur. If it is necessary to remove the protective film to inspect the plastic surface, it is important to recover the surface with the film and to use a low adhesive tape to keep the film in place
2. If damages are present on the panel surface small scratches and abrasions can be removed.
3. Partial Detachment of External Skin
4. If the surface sheet separates from the core: •
5. Trimming: apply tape to the affected areas to prevent further delamination. •
6. Repairing: gently lift the detached skin (without causing a further detachment) and place a light layer of Anglosol 2000 or Anglo 731 adhesive over the core. Clamp the area to be repaired and allow approximately 2 hours for the adhesive to harden.
7. Condensation Within Core Cells
8. When Bonded Series panels are placed in environment at low temperature, even after edge sealing, condensate can occur inside the cells of the core. This phenomenon is not to be considered a panel defect, as it is transitory and tends to disappear when temperature increases.

END OF SECTION

SECTION 08910
ALUMINUM ASSEMBLIES

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 the design, engineering, fabrication and installation including all labor, materials, equipment and services necessary to complete the aluminum assemblies as shown on the drawings and/or specified herein, including, but not limited to, the following:*

- 1. Fixed frame aluminum assemblies.
- 2. Aluminum and glass entry doors and frames.
- 3. Anchors, hardware and accessories, including trim pieces as shown on drawings.

1.3 SYSTEM REQUIREMENTS

- A. General Standard: In addition to requirements shown or specified, comply with applicable provisions of Aluminum Curtain Wall Design Guide Manual for design, materials, fabrication and installation of component parts.

- B. Design Requirements

- 1. Metal stick framed systems with interior and exterior exposed metal framing.
- 2. Perimeter conditions shall allow for installation tolerances, expansion and contraction of adjacent materials, and sealant manufacturer's recommended joint design.
- 3. Drawings are diagrammatic and do not purport to identify nor solve problems of thermal or structural movement, glazing, anchorage or moisture disposal.
- 4. Requirements shown by details are intended to establish basic dimension of unit, sight lines and profiles of members.
- 5. Do not assume glass, sealants, and interior finishes contribute to framing member strength, stiffness, or lateral stability.
- 6. Assemblies shall be free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.
- 7. Attachment considerations are to take into account site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
- 8. Anchors, fasteners and braces shall be structurally stressed not more than 50% of allowable stress when maximum loads are applied.
- 9. Allow for expansion and contraction due to structural movement without detriment to appearance or performance.

10. Provide concealed fastening.
11. Metal faces are required to be visually flat under all lighting conditions, subject to acceptance of COMMISSIONER.
12. Provide uniform color and profile appearance at components exposed to view.
13. Not Permitted: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.

1.4 QUALITY ASSURANCE

A. Reference Standards

1. Aluminum Association (AA).
2. National Association of Architectural Metal Manufacturers (NAAMM).
3. Architectural Aluminum Manufacturers Assoc. (AAMA).
4. American Welding Society (AWS).
5. American National Standards Institute (ANSI).

B. Contractors' Qualifications

1. Aluminum assemblies and all necessary and required component parts specified herein shall be the product of a manufacturer who can furnish supporting evidence of manufacturing experience in design, fabrication, erection of aluminum assemblies, and of having been regularly engaged in such design, fabrications and erection for a period of three (3) years. Such experience shall have been in connection with custom fabrication similar to requirements of this project. Qualifications of manufacturer shall be subject to the review and acceptance of the COMMISSIONER.

C. Manufacturer's Instructions: Submit manufacturer's printed installation instructions.

D. To ensure quality of appearance and performance, obtain materials for systems from either a single manufacturer or from manufacturer approved by systems manufacturer.

E. Installer Qualifications: Certified in writing by system manufacturer as qualified for installation of specified systems.

F. Manufacturer's Field Engineer or Authorized Representative: Conduct a minimum of two field visits to validate warranty requirements.

G. Engineer Qualifications: Registered professional engineer licensed to practice structural engineering in jurisdiction where Project is Located, with three years experience in design of aluminum assemblies. Conformance with general performance requirements, clear span vestibule glass framing members and channel glass horizontal and vertical bearing and connections shall be calculated and sized (including stiffeners) and submitted for approval with engineer seal and signature.

Certifications:

1. Engineering Certifications.

- H. Perform work in accordance with AAMA SFM-1 and manufacturer's written instructions.
- I. Conform to requirements of ANSI A117.1 and local amendments.
- J. Performance Requirements
 - 1. Except when applicable codes make other provisions, or as otherwise noted herein, the loads shall act in combinations that provide the most unfavorable conditions. The performance requirements shall include, but not necessarily be limited to, the following items:
 - a. Provision for Thermal Movement: The work shall be designed to provide for such expansion and contraction of component materials, as will be caused by a surface temperature ranging from -20 deg. F. to 180 deg. F., without causing buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance or other detrimental effects. The amount of such movement that is accommodated in the Contractor's design shall be identified on Contractor's submittal drawings and shall be accompanied by thermal calculations substantiating that adequate accommodation has been provided.
 - b. Fixed frame aluminum assemblies with "thermal break" design shall meet the following criteria when tested in accordance with AAMA 1503.1 and ASTM C236:
 - 1). CRF (frame only) not less than 70.
 - 2). U value not more than 0.65.
 - c. For fixed frames, when tested in accordance with ASTM E283, air infiltration shall not exceed .06 CFM per sq. ft. of fixed area at 6.24 psf pressure differential.
 - d. For fixed frames, when tested in accordance with ASTM E331, there shall be no water penetration at a test pressure of 15.0 psf pressure differential with a water rate of 5 gallons/hr. sq. ft.
 - e. Structural Performance for Fixed Frames: Provide the glazed aluminum glaze system to withstand the effects of a wind load of 30 psf acting inward and outward, normal to the plane of the wall, when tested in accordance with ASTM E 330, with no material failures or permanent deformation of structural members. Provide internal stiffeners and supports as required.
 - 1). Structural test pressure shall be equal to 150 percent of the inward and outward acting design wind pressures.
 - 2). Deflections: The fixed frame shall be capable of withstanding building movements including wind loading and of performing within the following limitations:
 - (a). Deflection of framing members perpendicular to the plane of the wall shall not exceed L/175 of its clear span.
 - (b). Deflection of members parallel to the plane of the wall, when carrying its full dead load, shall not exceed an amount that will reduce glass bite by less than 75 percent of the design dimension and shall not reduce edge clearance between itself and the panel, glass, or other fixed member immediately below to less than an inch.

- f. Structural performance of overhead vestibule members @ Channel Glass and other clear span overhead members: Contractor shall provide internal stiffeners for overhead vestibule members that minimize frame deflection to L/360 or max deflection of associated glass members, whichever is more restrictive. The Vertical and horizontal support tubes shall be internally structurally reinforced and joined by concealed fastening devices.
 - g. All operable sash shall conform to the minimum standards HC-40 of ANSI 101-7
 - 1). Doors shall conform to HGD-HC40.
 - h. The system shall perform to these criteria under a wind as required by the prevailing Building Code.
 - i. Aluminum assemblies shall be engineered, fabricated and installed to resist seismic forces per prevailing Codes and Ordinances.
2. Structural Design Loads: The allowable stresses for aluminum assembly elements shall conform to the minimum standards published in the Aluminum Association's "Aluminum Structures", latest edition, and other applicable codes or regulations. The minimum design loads herein specified shall comply with the following requirements, including, but not necessarily limited to, those as established by the American National Standards Institute (ANSI) A58.1 and applicable Building Code, and other applicable building codes and regulations.
3. Anchorage and Structural Support Framing
- a. The anchor assemblies and components, and support framing, including related connections and/or fasteners, for and related to the aluminum assemblies shall be furnished and installed as required for full compliance with the specified performance criteria. The items indicated and/or noted on the drawings are schematic and do not necessarily indicate the exact and/or required scope, type, shape or profile. Additional anchorage and structural support framing shall be added or complemented as required.
 - b. Anchorage and support framing shall accommodate thermal and building movements without any harmful effect on the assemblies including glass and glazing and sealant applications. Anchorage (bracing, inserts, clips, bolts, etc.) shall withstand 1.5 x wind load requirements.
 - c. It shall be this Contractors' responsibility to furnish all devices for the support of the framing systems and their components, which will be required to be embedded into or attached to the masonry, concrete or metal.
4. The Contractor shall demonstrate that system components and attachments to building for the work of this section meet or exceed the performance requirements described above and building code requirements for wind loading per section 27-569 of the NYC Building Code. The components of the work of this section shall resist the pressures due to wind as prescribed in NYC Building Code reference standard RS 9-5. Wind shall be assumed to act from any direction. For continuous framing, the effects of partial loading conditions shall be considered.

5. Attachment Considerations: Account for site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening and fracturing connection between components

1.5 SUBMITTALS

- A. The samples and certificates listed below are required to be submitted by the Contractor to the COMMISSIONER for review. An omission of an item or items does not relieve the Contractor from this responsibility, and for compliance with the contract documents, of which this is a part.

SAMPLES

| Item No. | Size | Description |
|----------|----------|--|
| 1. S1 | 12" long | Extruded member with each color. |
| 2. S2 | 6" x 6" | Separators |
| 3. S3 | --- | Sealant color charts |
| 4. S5 | --- | Actual anchors of each type and kind as requested by the COMMISSIONER. |

- B. Submit certification indicating that assemblies meet Performance Requirements specified herein.
- C. Submit manufacturer certification that the glass weight, thickness and dimensions are within aluminum assemblies product performance limits. Indicate areas where conformance with this or other criteria requires internal stiffeners and indicate the size of required stiffeners.
- D. Shop Drawings
 1. Submit shop drawings prepared by Product Manufacturer to COMMISSIONER for COMMISSIONER's review in accordance with requirements of the Contract Documents. Shop drawings not produced by the manufacturer will not be accepted.
 2. No work shall be fabricated until the shop drawings and other related submittals, documentation, certifications and shapes have been reviewed by the COMMISSIONER.
 3. Shop drawings shall incorporate plans, elevations, sections and full size details for the work covered by this Section. the full size details shall show and note metal and glass thicknesses, types and finishes; areas to be sealed and sealant materials; gaskets; direction and magnitude of thermal expansion; direction and magnitude of applicable building movement; type of construction, including joinery, fasteners and welds; anchorage assemblies and components; the fabrication and erection tolerances for the work in this Section and the adjoining work even though not included in the work of this Section, to insure coordination of this work and the work of other trade contractors.
 4. Interior and exterior sealants shall be designated and identified as to type, color, back-up and primers.
 5. Anchorage assemblies and their related components shall be thoroughly scheduled and described on the shop drawings so that an installation can be evaluated to insure responsibility for furnishing and installing materials according to the shop drawings.

E. Product Data

1. Submit copies of each of the following to the COMMISSIONER for review. Product data shall consist of printed literature, data and catalog sheets and cuts and, where applicable, test reports.
2. Information submitted shall include manufacturers' recommendations and limitations on installation preparation, storage and handling procedures.
 - a. Sealants: each type and kind plus color charts.
 - b. Neoprene components and silicone components: Each type and kind.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver aluminum assemblies and all necessary and required components to the job site in as large pre-assembled sections as practical, and transport handle and store in such a manner as to preclude damage of any nature.
- B. Deliver other materials to the site, ready for use, in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Remove delivered materials which are disfigured, cracked, chipped, or scratched, or otherwise not suitable for installation from the job site and replace with new materials. Delivered materials shall be identical to approved samples in every respect with regard to color, finish and approved shop drawings.
- C. Store materials under cover in a dry and clean location, off the ground.
- D. Special care shall be exercised when handling, shipping and erecting factory-finished aluminum to avoid abrasion or other damage to the finished surfaces. Stacking and storing of the members - in the shop, in transit, and at the job site - shall be done using softeners and timbers to keep individual members free from contact with the ground, and with each other; and shall be protected from soiling by adjacent fabrication or construction operations.

1.7 JOB CONDITIONS

A. Environmental Requirements

1. Install materials specified herein within the temperature and humidity criteria recommended by the manufacturer of each material.
2. Under no circumstances shall materials be installed on surfaces which contain frost, condensation, dirt, grime or other foreign materials encountered which will hinder or create a set of circumstances which will prevent the material(s) from properly being installed, and once installed from functioning for use intended.

1.8 GUARANTEES AND WARRANTIES

A. General

1. The work included in this Section shall be fully warrantied by manufacturer for performance, materials and workmanship for a period of no less than two (2) years from the date of Substantial Completion unless otherwise noted herein.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide products manufactured by Vistawall, Kawneer or Wausau or approved equal. The following names and model numbers are those of Vistawall; other manufacturers noted herein are acceptable subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

1. DOORS

- a. Rugged MS Series Heavy Duty, frames and related assemblies. Co-ordinate through bolt mounting of pull hardware.
- b. Exterior Doors: 8" bottom rail, 5" Wide Stile, 4" top rail unless deeper section required for concealed closer or pull bar attachment.
Interior Door: 8" bottom rail, 3 3/4" Medium Stile, 8" top rail.
- c. Provide internal stiffeners hinge reinforcing at door and jamb as required by door size and weight with glass. Verify glass weight conforms with maximum door, frame and hinge allowances. Provide internal door stiffeners and jamb reinforcing as recommended by manufacturer for glass weight.

2. EXTERIOR/INTERIOR VESTIBULE APPLICATION

- a. HP-175, Thermal Glazing Clip, front set-1 3/4" X 6" mullion profile, 1" glass thickness.
- b. BMS-3000 overhead glazing system: Member sizes/ reinforcing and glass system per manufacturer shall be certified to be in compliance with applicable provisions of the NYC Building code. Interior portion of overhead glazing system is not required to meet water penetration requirements of exterior portion. Vertical and horizontal support tubes shall be internally structurally reinforced/stiffened and joined by concealed methods as determined and certified by contractor engineer.
- c. Provide internal stiffeners as generally required for required loads and fasteners/attachments and specifically for vestibule ceiling spans, door jambs, channel glass support and aluminum text mounting.

3. ROOM DIVIDER INTERIOR APPLICATION

- a. FG-3000 Standard 2" x 4 1/2" Flush Glaze System adapted for silicone butt-glazed fixed glass thickness.

4. Provide clips, closure pieces and other components necessary for a complete finished installation.

2.2 METALS

A. Aluminum

1. Aluminum assemblies and all necessary and required components shall be manufactured of extruded aluminum shapes conforming to profiles, sizes and arrangements noted on the

drawings. Metals shall be free from defects which will impair their strength, durability, performance or appearance.

2. Minimum wall thicknesses for extrusions shall be as required to conform to the performance requirements established herein but not less than .125" for main framing and .050" for snap on stops.
3. The alloys and tempers for aluminum elements which are to receive baked-on finishes shall be as recommended by the aluminum manufacturer.
 - a. Alloy 6063-T5 (ASTM B221) as a minimum.
4. Aluminum not exposed to view, and where approved, may be mill finish 3003 except when it may be in contact with sealant.
5. Aluminum assemblies shall incorporate an integral flexible thermal break material held in place without clips or mechanical fasteners.

B. Steel

1. Steel members for plates, angles, tees and other rolled or built up shapes for anchoring to adjacent construction shall conform to ASTM A36. Hot dip galvanizing shall conform to ASTM A123, A153 and A384.
2. Steel members used for internal supports shall conform to ASTM A36 and shall be shop primed with zinc chromate primer.

C. Fasteners

1. Type, size, alloy, quantity and spacing of the fasteners and anchorage devices will be as required for performance.
2. Unless otherwise noted on the drawings, bolts and other fastening devices, including their accessory items (washers, nuts, etc.), shall incorporate self-locking devices and torque tightening, as required, to achieve the maximum torque tension relationship in the fasteners.
3. Fasteners where exposed: Aluminum or 304 (19-8) stainless steel finished to match exposed aluminum, and where not exposed may be cadmium plated or zinc plated steel in accordance with ASTM A165 and A164. Anchors shall be aluminum or steel, providing the steel is properly insulated from the aluminum.

D. Shims, Blocking and Spacers

1. Metals used for shims, blocking and spacers shall be stainless steel incorporating separators for dissimilar materials, and at dynamic connections as and where required.
2. Do not use aluminum or plastic shims at structural connections or horseshoe (U) shaped shims at dynamic or other connections where they could work free.

E. Metal Protective Materials

1. Bituminous coating shall be a cold applied asphalt mastic conforming to SSPC Paint 12, compounded for 30 mils thickness per coat.

2. Aluminum metal-and-concrete paint shall be a standard product specifically recommended by the manufacturer to protect aluminum against alkaline, corrosive and galvanic action.
3. Cadmium Plating: ASTM A165, Type NS.
4. Paint for Carbon Steel Used for Internal Supports
 - a. One shop coat of zinc chromate primer conforming to Fed. Spec. TT-P-645.
5. Galvanizing of Carbon Steel for Anchorage
 - a. Steel Sheets: FS QQ-S-775c.
 - b. Hot-dip for Shapes, Plates, Bars and Strip: ASTM A123.
 - c. Electro-galvanizing: ASTM A164 or FS QQ-A-325a.
6. Preformed Mastic Tape: NAAMM Specifications for Non-Shrinking, Non-Resilient Preformed Sealing Compound.

F. Finish

1. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: non-specular as fabricated; Chemical Finish: etched, medium matter; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

2.3 SEALANTS

- A. The compatibility and sequence of installation for sealants shall be carefully considered in design proposals to insure the required cure and optimum performance. Sealants shall not degrade and/or fail under design conditions including, but not limited to, thermal movement, ultra-violet exposure and/or other adverse environmental conditions.
- B. Butter all exposed and concealed metal-to-metal, including tight or butt type metal-to-metal assembly joints with a full bed of sealant prior to assembly. High modulus and low modulus silicones can be used according to wall requirements.
- C. Concealed metal-to-metal and metal-to-concrete or other substrate material joints, or sleeved conditions where elements are to be installed or embedded in a full bed of sealant: A non-drying, non-skinning type of synthetic butyl rubber sealant may be considered where recommended for the specific application. Use only in areas acceptable to the COMMISSIONER and do not use at exposed areas.
- D. Select joint fillers, primers and back-up materials per the written recommendations from the sealant manufacturer for each specific application. Shape, size, hardness, compatibility and bond breaking requirements are factors to be considered.
- E. Sealants shall be compatible with adjoining or adjacent sealants, back-up materials, substrate materials and their respective finishes.
- F. Sealants: One part, silicone conforming to ASTM C920, Type M, Grade NS, Class 25 having a performance range of -40 deg. F. up to 200 deg. F. and a dynamic movement capability of plus or minus 25%. Hardness (Shore A) -22.

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- G. Color of sealants for internal use, not exposed to view, shall be at the option of this trade Contractor. Color of sealant exposed to view will be selected by the COMMISSIONER for all joints required for this installation.
- H. Acceptable Sealant Manufacturers are as Follows
 - 1. General Electric
 - 2. Dow Corning
 - 3. Or an equal acceptable to the COMMISSIONER.

2.4 ALUMINUM DOORS

- A. Aluminum doors shall be heavy duty meeting 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. Air Infiltration: (Applies only to single acting offset pivot or butt hung entrances)
 - a. Air infiltration shall be tested in accordance with ASTM E283, 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 lin. ft. of perimeter crack. A pair of 7'-0" x 7'-0" entrance doors and frame shall not exceed 1.0 cfm per lin. ft. of perimeter crack.
- B. Door hardware is specified in Section 08700.
- C. Corner construction shall consist of mechanical clip fastening, SIGMA deep penetration and fillet welds. Glazing stops shall be snap-in type with EPDM glazing gaskets.
- D. Door bottom rail of exterior doors shall have an EPDM blade gasket sweep strip applied with concealed fasteners.
- E. 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.
- F. The door weathering 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.
- G. The door weathering 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.
- H. The meeting stiles on pairs of doors shall be equipped with an adjustable astragal.

2.5 FABRICATION AND MANUFACTURE

A. Workmanship

1. Execute work using skilled workman, especially trained and experienced in the applicable trades employed and in full conformity with applicable provisions of the listed References and Standards and as otherwise noted on the drawings or as specified herein. Fabrication shall occur to the greatest extent possible in the factory.
2. Carefully fabricate and assemble work with proper and approved provision for noiseless thermal expansion and contraction, fabrication and erection tolerances, adjoining building component tolerances and dynamic movements.
3. Execute forming and welding operations prior to finishing operations.
4. Work: True to detail with sharp, clean profiles, straight and free from defects, dents, marks, indentations, waves or flaws of any nature impairing strength or appearance; fitted with proper joints and intersections and with specified finishes.
5. Removable members such as glass stops, fillers, or closures shall be extruded and securely engaged into adjacent components. Extrusions to be tightly toleranced to eliminate edge projection or misalignment at joints.
6. Install sleeves, lugs and related items in a full bed of sealant and seal perimeter when component is in final installed position. Clean excess sealant from exposed surfaces.
7. Labels and Trademarks: Labels and trademarks, including applied labels, shall not be visible on the finished work.
8. Aluminum work shall be of extrusions, sheets, plates, or other forms or combinations thereof, as best suited for the production of the work and as per the shop drawings.

B. Prepare Doors to receive custom pull bar. Provide door frame reinforcing as required. Door pull bar to be factory installed.

C. Provide custom profile face plate where indicated on drawings.

D. Connecting and Fastening Devices

1. Fastenings: Of a strength sufficient to support both horizontal wind load and vertical dead load, with safety allowance specified herein and spacing and of such sizes as will develop the maximum strength of the members they secure or support, in terms of adequate unit stresses, in accordance with submitted shop drawings.
2. Seal and tool fasteners penetrating watertight or airtight assemblies.
3. Furnish to other trades proper anchoring inserts and other supporting devices which will be required to set into the concrete, attached to structural steel or otherwise attached to masonry or metal. Furnish location drawings along with the devices to be embedded well in advance of this work to assure job progress. Supporting devices shall be steel; aluminum devices will not be permitted for structural connections.

E. Protection of Metals

1. Provide protection against galvanic action wherever dissimilar metals are in contact.

2. Aluminum which is to be in contact with cured concrete or masonry mortar shall have its contact surfaces protected wherever the contact surfaces may entrap moisture and corrosive elements. Metals which are to be in contact with concrete or masonry mortar shall have their contact surfaces protected with an acceptable coating or separator.

F. Welding

1. Preform welding of aluminum work by the inert gas shielded arc or fluxless resistant techniques, in accord with recommendations of the American Welding Society and use electrodes or methods recommended by the suppliers of the metals being welded.
2. Welds behind finished aluminum surfaces shall be done in an approved manner to eliminate distortion and discoloration on the finished side. Remove weld spatter and welding oxides on finished surfaces by descaling and grinding. Provide low heat fillet welds using chill bar on finished side to eliminate dimpling, distorting and discoloration on the finished or exposed surface. Plug, puddle or spot welding will not be permitted.

- G. Shop Painting of Carbon Steel: Items of carbon steel, unless galvanized, shall be thoroughly cleaned of loose scale, fillings, dirt and other foreign matter, and painted with zinc chromate primer.

H. Reinforcing

1. Provide internal steel reinforcing components as required to conform to performance criteria and as necessary and required to accommodate adjacent work relying on this work for support and hardware cuts in jambs as required. Internal reinforcing shall also be provided as required to receive decorative glass system supports installed on the interior by others. Paint internal steel as specified in para. E. above.

2.6 FINISHES

A. Clear Anodized:

1. Conforming to AA-M12C22A31 and AAMA 611.
2. Architectural Class II, etched, medium matte, clear anodic coating, 0.4 mil minimum thickness.

PART 3 EXECUTION

3.1 INSPECTION

- A. Study the Contract Drawings and specifications with regard to the work as shown and required under this Section so as to insure its completeness.
- B. Examine surfaces and conditions to which this work is to be attached or applied, and correct any conditions or surfaces exist which are detrimental to the proper and expeditious installation of the work. Starting on the work shall imply acceptance of the surfaces and conditions to perform the work as specified.
- C. Verify dimensions taken at the job site affecting the work.
- 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.
- E. Supporting elements shall be examined and spot checked to assure that tolerances specified herein have been adhered to. Check existing and new concrete surfaces and examine that they are within the construction tolerances and conditions to install the work of this Section.

- F. Items which are furnished for incorporation into the work by other trades shall be examined, to assure that they are properly located to accept all other related work.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and applicable provisions of AAMA Aluminum Curtain Wall Design Guide Manual.
- B. Align assemblies plumb and level, free of warp or twist, aligning with adjacent work.
- C. Tolerances
 - 1. Limit variations from plumb and level:
 - a. 1/8" in 20'-0" vertically and horizontally.
 - b. 1/4" in 40'-0" either direction.
 - 2. Limit offsets in theoretical end-to-end and edge-to-edge alignment:
 - a. 1/16" where surfaces are flush or less than 1/2" out of flush and separated by not more than 2".
 - b. 1/8" for surfaces separated by more than 2".
 - 3. Step in Face: 1/16" maximum.
 - 4. Jog in Alignment: 1/16" maximum.
 - 5. Location: 1/4" maximum deviation of any member at any location.'
 - 6. Tolerances are not accumulative.
- D. Provide attachments and shims to permanently fasten system to building structure.
- E. Anchor securely in place, allowing for required movement, including expansion and contraction.
- F. Separate dissimilar materials at contact points, including metal in contact with masonry or concrete surfaces, with protective coating or preformed separators to prevent contact and electrolytic action.
- G. Set sill members in bed of sealant. Set other members with internal sealants and baffles to provide weathertight construction.
- H. Ensure that dead load from curtain wall system is not transferred to stone veneer.
- I. Wherever aluminum comes in contact with the steel surfaces, the contact surfaces shall be provided with approved type separators and other devices which shall prevent galvanic action from taking place.
- J. Anchorage of the work to the structure shall be by proper methods and in strict accord with the reviewed shop drawings. After the components are properly positioned rigidly fix the connections by welding or other positive means.
- K. Welding

1. Perform welding using skilled mechanics qualified or licensed in accord with local building regulations, and conform to the recommended practices of the American Welding Society. Clean welds and adjoining burned areas in prime coated surfaces thoroughly and repaint with one coat of primer and coat welds in galvanized steel with one coat of zinc-rich paint. Take special care to protect glass and other finished surfaces from damage and to prevent fires. Preheat structural steel building components as required for the full penetration and distribution of structural welds.

L. Sealant Application

1. Thoroughly clean the sealant joint substrate surfaces, per the sealant manufacturer's written recommendations, prior to the application of the sealant materials. Tape and tool exposed sealant applications as required for a clean, neat and watertight joint. Tool concealed sealant applications.
2. Metal-to-metal joints between aluminum elements shall be thoroughly cleaned and sealed by buttering joints with sealant immediately prior to the final assembly of abutting sections. Clean excess sealant from exposed surfaces.
3. Install sealant materials in strict accord with the manufacturer's instructions and apply using mechanics trained and experienced in their use. Before applying sealant, remove dirt, dust, moisture and other foreign matter completely from the substrate surfaces as required to maintain a clean and neat appearance. Tool sealant compounds to fill the joint and provide a smooth finished surface.
4. Install primers and proper diameter backer rods for exterior sealant work in accordance with the recommendations of the sealant manufacturer for encountered conditions.

3.3 ADJUSTMENTS, CLEANING AND PROTECTION

A. Damage to Factory-Applied Finish

1. Should the factory-applied coatings become scratched, abraded, or damaged during transport, delivery, storage or erection, it shall be this trade Contractor's responsibility to remove and/or repair those defective areas or components, as directed by the COMMISSIONER and to the satisfaction of the COMMISSIONER.
2. It is the essence of this repair work that it shall be identical to the factory-applied finish with regards to texture gloss finish, appearance and performance.

B. Protection and Cleaning

1. Upon completion of work, remove protective coverings from exposed surfaces, and clean surfaces of soil and discoloration. Cleaning shall be in accord with the provisions of the requirements of the applicable manufacturers of the aluminum, glass, gasket and aluminum finishing manufacturers.
2. Weep holes and drainage channels shall be unobstructed and free of dirt, rubbish and sealants.
3. Clean all exposed work erected by this Section including interior and exterior surfaces of exterior glass. Remove all glazing compound and other foreign matter and thoroughly clean metal using cleaning preparations which will in no way harm aluminum or glass surfaces. During this cleaning, repair damaged surfaces, scratches, marks, etc., found to the satisfaction of the COMMISSIONER and CITY OF NEW YORK.

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4. Exercise care when cleaning the exterior portions of the building to protect other work and sealant to metal joint work.
- C. The finished installation of the work shall be free of defects. Before final completion and acceptance of the building, this Contractor shall repair and/or replace at his own expense defective work, to the satisfaction of the CITY OF NEW YORK and the COMMISSIONER.

END OF SECTION

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SECTION 08955
GLASS CHANNEL FAÇADE

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 the design, engineering, fabrication and installation including all labor, materials, equipment and services necessary to complete the glass channel facade as shown on the drawings and/or specified herein, including, but not limited to, the following:*

1. Profiled Glass Window Wall System.
2. Reglit Profiled Glass System Description –Double Shell Installation (Dual Glazed)
 - a. Glass Plank for Walls
 - b. Waterproofing and Sealants: Specifically designed for reglit system and supplied by the manufacturer.

B. Design Requirements:

1. Manufacturer Responsible for designing system [units], including anchorage to structural system and necessary modifications to meet specified requirements and maintain visual design concepts.
2. Employ registered professional engineer, licensed to practice structural engineering in jurisdiction where Project is located, to engineer each component of the channel glass system.
3. Drawings: The drawings are diagrammatic and intended to establish basic dimension of units, sight lines, and profiles of units.
4. Provide concealed fastening wherever possible.
5. Attachment Considerations: Account for site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening and fracturing connection between piping and units.

1.3 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 for this section.
- B. Single Source Responsibility: Furnish total system from one manufacturer.
- C. Manufacturer's Field Engineer or Authorized Representative: Conduct a minimum of two

field visits to validate warranty requirements.

- D. **Engineer Qualifications:** Registered professional engineer licensed to practice structural engineering in jurisdiction where Project is Located, with three years experience in design of glass envelopes.

Certifications:

- 1. Engineering Certifications.

- E. **Welder Qualifications:** AWS certified within past 12 months for each type of weld required.

Certifications:

- 1. Certificates verifying AWS qualifications for each welder employed on Project

- F. **Performance Standards:** As a minimum, conform to the following:

- 1. **Provision for Thermal Movement:** The work shall be designed to provide for such expansion and contraction of component materials, as well be caused by a surface temperature ranging from -20 deg. F. to 180 deg. F., without causing bucking, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance or other detrimental effects. The amount of such movement that is accommodated in the Contractor's design shall be identified on Contractor's substantiating that adequate accommodation has been provided.
- 2. When tested in accordance with ASTM E283, air infiltration shall not exceed .06 CFM per sq. ft. of fixed area.
- 3. When tested in accordance with ASTM E331, there shall be no water penetration at a test pressure of 8.0 psf.
- 4. Structural performance shall be based on:
 - c. Maximum deflection of 1/175 of the span.
 - d. Allowable stress with a safety factor of 1.65.
- 5. The Contractor shall demonstrate that system and its components and attachments to building for the work of this section meet or exceed the performance requirements described in this section and building code requirements for wind loading per section 27-569 of the NYC Building Code. The components of the work of this section shall resist the pressures due to wind as prescribed in NYC Building Code reference standard RS 9-5. Wind shall be assumed to act from any direction. For continuous framing, the effects of partial loading conditions shall be considered. Design wind load shall be the greater of the standard listed above and 30 psf .

1.4 SUBMITTALS

- A. **Product Data:** Submit following:

- 1. Product data for translucent linear glass units, framing system, and glazing accessories.
- 2. Include sample of warranty customized for this Project.

- B. **Shop Drawings:**

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1. Submit for plan, elevation, connection details, installation details, and interface with adjacent construction.
 2. Stamp with seal and signature of professional structural engineer responsible for design.
- C. Samples: Submit 300 mm (12 Inch) length by full panel width in size illustrating full range of color and appearance.
- D. Informational Submittals: Submit following packaged separately from other submittals:
1. Test Reports: Submit following:
 - A Certified test reports showing compliance with specified design requirements.
 2. Certifications specified in Quality Assurance article.
 3. Manufacturer's instructions.
 4. Manufacturer's field reports.
- E. Closeout Submittals:
1. Warranty.

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.

1.6 WARRANTY

- A. Special Warranty:
 1. Warrant installed units to be free from defects in material and workmanship for period of 10 years.
 2. Include coverage against crack, warp, pit, corrode, peel or blister under normal use and service.
 3. Installation warranty of 10 year(s) will be supplied by the manufacturer.

PART 2 -- PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Acceptable Products and Manufacturers:
 1. Pilkington Profilit™ supplied by Technical Glass Products; Kirkland, Washington. The following names and model numbers are those of Pilkington Profilit™; products of other manufacturer indicated subject to meeting drawing details and performance criteria specified herein.
 2. Bendheim Wall Systems, Passaic, NJ.

2.2 MATERIALS

- A. Aluminum Assemblies: Materials to conform to ASTM B-221, alloy 6063-T6, extruded aluminum, and to have "Eloxal" finish (Clear Anodized). **WT Thermal frame profiles. Provide .125" thk Aluminum break metal pan at base.**

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- B. **Glazing:** Glazing shall be **Profilit K 25/60/7 Dual/Double glazed system; Standard Cast, Low-E coating, Tempered.**
 - 1. Sealing between glass panels shall be done using "Reglit-Plast".
- C. **Sealant:** Silicone conforming to the requirements the manufacturer.
- D. **Resilient Sealing and Connection Material:** "Reglit-Plast".

2.3 ACCESSORIES

- A. **Anchorage Devices:** Manufacturer's standard formed or fabricated steel or aluminum assemblies or shapes, plates, bars or tubes. Provide vertical and/or horizontal steel transition plates or other extensions from new steel tube brace at head.
 - 1. Hot-dip galvanized steel assemblies after fabrication, ASTM A123, 0.05 kg [(2.0 ounce)] minimum coating.
- B. **Fasteners:** Aluminum, non-magnetic stainless steel or other non-corrosive materials compatible with items being fastened.
 - 1. Provide concealed fasteners wherever possible.
 - 2. **Exposed Locations:** Phillips flathead screws with finish matching item fastened.
 - 3. **Concealed Locations:** Manufacturer's standard fasteners.
- C. **Expansion Anchor Devices:** Lead-shield or toothed-steel, drilled-in, expansion bolt anchors.
- D. **Protective Coatings:** Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 0.76 mm [(30 mil)] thickness for each coat; or alkyd type zinc chromate primer, FS TT-P-645.
- E. **Perimeter Joint Sealant and Backer Rod:** Silicone-Glazing.
 - 1. **Colors:** Standard colors as selected by CITY OF NEW YORK from manufacturer's full range of colors.
 - 2. **Primer:** If required by sealant manufacturer for applications show.
 - 3. **Sealant Backing, Bond Breaker Rod and Tape:** Closed cell unless required by sealant manufacturer.
 - 4. **Acceptable Glazing Products and Manufacturers:**
 - a. 1199, Dow Corning.
 - b. 5731, Schnee Morehead.
 - c. Silglaze SCS, General Electric.
 - d. Tremco Tremsil 600

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where the glass channel façade is to be installed and notify the CITY OF NEW YORK 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 COORDINATION

- 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. Make measurements as required in the field to assure proper fit.

3.3 FABRICATION

- A. Coordination of Fabrication: Check actual frame or door openings required in construction work by accurate field measurements before fabrication.
 - 1. Fabricate units to withstand loads which will be applied when system is in place.

- B. General: Provide each unit of framework continuous.
 - 1. Disassemble only to extent necessary for shipment and installation.
 - 2. Conceal fasteners where ever possible.
 - 3. Form gutter and weep system to prevent water infiltration.
 - 4. Separate dissimilar metals and aluminum in contact with concrete utilizing protective coating or preformed separators which will prevent contact and corrosion.

- C. Aluminum Framing: Provide members of size, shape and profile indicated, designed to provide for glazing from exterior or interior.
 - 1. Provide manufacturer's standard thermal isolation between exterior and interior aluminum extrusions.
 - 2. Fabricate frame assemblies with mitered or coped joints.
 - 3. Maintain accurate relation of planes and angles, with hairline fit or contacting members.
 - 4. Seal horizontals and direct moisture accumulation to exterior.
 - 5. Provide spacers and other materials used internally or externally that are corrosive resistant, non-staining, non-bleeding and compatible with adjoining materials
 - 6. Fabricate framing for expansion and contraction due to temperature changes without detriment to appearance or performance.
 - 7. Make provisions in framing for minimum edge clearance, nominal edge cover and nominal pocket width for thickness and type of glazing or infill used in accordance with recommendations of manufacturer and Technical Manual.

- D. Welding: Comply with recommendations of American Welding Society (AWS).
 - 1. Use recommended electrodes and methods to avoid distortion and discoloration.
 - 2. Grind exposed welds smooth and flush with adjacent surfaces; restore mechanical finish.

3.3 INSTALLATION

- A. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the CITY OF NEW YORK, anchoring all components firmly into position for long life.

END OF SECTION

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SECTION 09200
LATHING AND PLASTERING

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 lathing and plastering as shown on the drawings and/or specified herein, including, but is not limited to, the following:
1. Metal lath and support systems.
 2. Gypsum plaster for interior applications.
 3. Accessories.

1.3 QUALITY ASSURANCE

- A. Qualifications of Installers: For actual installation of lath and plaster, use only skilled journeyman plasterers who are completely familiar with the referenced standards and with the requirements for this work.
- B. Work of this Section shall conform to the following standards:
1. ASTM C 841 - Standard Specification For Installation Of Interior Lathing And Furring
 2. ASTM C 842 - Standard Specification For Application Of Interior Gypsum Plaster
 3. ASTM C 847 - Standard Specification For Metal Lath
 4. ASTM C 933 - Standard Specification For Welded Wire Lath
 5. ASTM C 28 - Standard Specification For Gypsum Plasters
 6. ASTM C 631-81 - Standard Specification for Bonding Compounds For Interior Plastering
 7. ASTM C 35 - Standard Specification for Inorganic Aggregates For Use In Gypsum Plaster
 8. ASTM C 206 - Standard Specification for Finishing Hydrated Lime
- C. Allowable Tolerances: For flat surfaces do not exceed 1/8" in 10'-0" for bow or warp of surface, and for plumb or level.
- D. Plaster wall assemblies shall be fabricated and installed so that deflection of plaster surfaces do not exceed L/360 when subject to a lateral load of 5 psf.

1.4 PRODUCT HANDLING

- A. General

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1. Deliver all manufactured products to the site in their original unopened containers with all labels intact and legible at the time of use.
 2. Do not permit scattering of materials or equipment but use all means necessary to ensure neatness of the site and structure at all times.
 3. Perform all cleaning of tools and equipment only in the areas set aside for that purpose.
- 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.

1.5 JOB CONDITIONS

- A. Environmental Conditions: Comply with referenced standards.
- B. Protect contiguous work from soiling, spattering, moisture deterioration and other harmful effects which might result from plastering.

PART 2 PRODUCTS

2.1 METAL PRODUCTS

- A. General
1. Interior Components: Rust-inhibitive paint finish on rolled channels and formed sheet metal of 16 ga. and heavier and on rods and bars of No. 7 ga. or 3/16" thickness and heavier, except for "High Humidity" areas.
- B. Lath
1. Provide galvanized steel, large opening diamond mesh lath weighing 3.4 lbs. per sq. yd. for interior use, complying with FS QQL-101 and ASTM C841.
 2. Where required over solid back-up, lath shall be self-furring type.
- C. Metal Plastering Accessories and Reinforcement
1. General: Coordinate depth of accessory with thickness of and number of coats of plaster to be applied. All accessories shall be of zinc alloy material.
 2. Small-Nose Corner Beads: General purpose type with expanded perforated flanges.
 3. Cornerite: Manufacturer's standard preformed interior corner reinforcement made from 2.5 lb. per sq. yd. diamond mesh lath.
 4. Square-Edged Casing Beads: Manufacturer's standard with expanded or short flange to suit application.
 5. Two-Piece Control Joints: Manufacturer's standard roll-formed pair of casing beads with modified back flanges providing positive slip joint action and dust barrier, adjustable for joint width variation of 1/8" to 5/8".

6. Corner Reinforcement: Special stucco-type woven galvanized wire corner reinforcing strips.
7. Line Wire: 18 ga. soft annealed steel wire.
8. Fasteners: Galvanized steel, of type and length suitable for adequate penetration of the substrate.

2.2 GYPSUM PLASTER SYSTEM

A. Materials

1. Aggregate: Sand for Gypsum plaster shall conform to the requirements of ASTM C35, latest edition.
2. Hydrated lime shall conform to the requirements of ASTM C206.
3. Binder shall be hair or fiber as recommended by the plaster manufacturer.
4. Gypsum neat plaster and calcined gypsum shall conform to the requirements of ASTM C28, latest edition..

B. Gypsum Plaster on Metal Lath

1. Scratch coat shall consist of one (1) part gypsum plaster to not more than two (2) parts sand by weight and pigment. If plaster is unfibered, add the proper amount of fiber as recommended by the plaster manufacturer.
2. Brown coat shall consist of one (1) part gypsum plaster to not more than three (3) parts sand by weight and pigment.
3. Finish coat shall be factory prepared mix as noted above.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where lathing and plastering 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 SELF-FURRING LATH

- A. Lap lath 1" at ends and 1/2" at side laps. Fasten lath to solid back-up using non-corrosive masonry screw anchors spaced 8" o.c. both directions that penetrate substrate a minimum of 2".

3.3 INSTALLATION OF PLASTERING ACCESSORIES

- A. Anchor accessories to the plaster base or substrate 8" o.c. along each flange, by wire tying to lath.
- B. Miter or cope exposed portions of accessory items at corners, and install with tight joints. Spline splices to avoid offsets; conceal splines.

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- C. Set exposed accessories plumb, level and true to line, with a tolerance of 1/8" in 10'-0". Shim as required and align units with adjoining work in a manner which will produce the best possible visual effect.
- D. Install metal casing beads where shown and at the following locations:
 - 1. At openings and terminations of plaster finish where otherwise edge of plaster would be exposed.
 - 2. Where interior plaster abuts adjacent wall.
 - 3. Where interior plaster abuts other finish, and termination is not lapped by other finish.
- E. Install metal corner beads at external corners.
- F. Install control joints where indicated on drawings following manufacturer's instructions.

3.4 GENERAL PLASTERING REQUIREMENTS

- A. Mechanically mix plaster materials at the project site; do not hand mix except where small amounts are needed, using less than one bag of plaster material.
- B. Sequence plaster installation properly with the installation and protection of other work, so that neither will be damaged by the installation of other work.
- C. Cut out and replace all unbonded spots. Build in the work of others and do all cutting and patching of plaster in this connection. Where abutting other built-in materials, plaster shall be finished tightly against them and by neatly trimmed.
- D. Repair surface defects. Surfaces shall be within 1/32" to 1/16" of true plane.
- E. Plaster thicknesses noted herein or on drawings shall be considered as a minimum; plaster shall be of such thickness required to plumb and square wall surfaces, to level ceilings so that plaster is flush with adjacent surfaces.

3.5 GYPSUM PLASTER APPLICATION

- A. Scratch Coat: Scratch coat shall be full and approximately 3/8" thick, applied with sufficient force to form good keys. Scratch coat shall be evenly cross-scratched upon attaining its initial set and shall be kept damp with a fog spray.
- B. Brown Coat: Brown coat shall be applied after the scratch coat has set, but not less than forty eight (48) hours after the application of the scratch coat.
 - 1. All joints in brown coat plaster shall be lap joints.
 - 2. After drying, all shrinkage cracks shall be cut out and filled with scratch coat plaster.
- C. Finish Coat: Finish shall be applied over brown coat, which has set and is surface dry, shall be scratched in thoroughly, laid on well, doubled back, and filled out to a true, even surface. The thickness shall be from 1/16" to 1/8". The finish shall be allowed to draw a few minutes and then shall be well troweled with water to a smooth surface, free from blemishes and trowel marks. Finish flat plaster items true and even within 1/8" tolerance in 10'-0".
- D. Total thickness of gypsum plaster shall be no less than 5/8".

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3.6 CUTTING AND PATCHING

- A. Cut, patch, point-up and repair plaster as necessary to accommodate other work and to restore work, free from cracks, dents and imperfections. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry-outs, efflorescence, sweat-outs and similar defects, including areas of the work which do not comply with specified tolerances, and where bond to the substrate has failed.
- B. Sand plaster lightly to remove trowel marks and arrises.

3.7 CLEANING AND PROTECTION

- A. Promptly remove plaster from surfaces which are not to be plastered. Repair floors, walls and other surfaces which have been stained, marred or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers and equipment and clean floors of plaster debris.

END OF SECTION

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SECTION 09205
LATHING AND CEMENT PLASTERING

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 lathing and plastering as shown on the drawings and/or specified herein, including, but is not limited to, the following:
 - 1. lathing and Portland cement based plaster (stucco).

1.3 TERMINOLOGY

- A. Definitions and description of terms shall be in accordance with ASTM C11, C841, and C926 and as specified.
- B. Underside of Structure Overhead: In spaces where steel trusses or bar joists are shown, the underside of structure overhead shall be the underside of the floor or roof construction supported by beams, trusses, and bar joists.
- C. Self-furring Lath: Metal plastering bases having dimples or crimps designed to hold the plane of the back of the lath 6 to 10 mm (1/4 to 3/8 inch) away from the plane of the solid backing.
- D. Solid Backing or Solid Bases: Concrete, masonry, sheathing, rigid insulation, and similar materials to which plaster is directly applied.
- E. Wet Areas: Areas of a building where cyclic or continuous exposure to very humid or wet conditions, or in which a dew point condition may occur in the plaster. Dew point conditions occur frequently in such areas as laundries, natatoriums, cart and dish washing spaces, hydrotherapy, kitchens, bathing or shower rooms and similar areas.

1.4 PROJECT CONDITIONS

- A. Maintain work areas for interior work at a temperature of not less than 4°C (40°F) for not less than 48 hours prior to application of plaster, during application of plaster and until plaster is completely dry.
- B. Exterior plaster shall not be applied when the ambient temperature is less than 4°C (40°F).
- C. Plaster shall not be applied to frozen surfaces or surfaces containing frost.
- D. Frozen materials shall not be used in the mix.
- E. Plaster coats shall be protected against freezing for a period of not less than 24 hours after application.

1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.
- B. American Society for Testing And Materials (ASTM):
 - A653/A653M-05.....Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - A641-03.....Zinc-Coated (Galvanized) Carbon Steel Wire

- C11-05.....Terminology Relating to Gypsum and Related Building Materials and Systems.
- C91-05.....Masonry Cement
- C150-05.....Portland Cement
- C207-05.....Hydrated Lime for Masonry Purposes
- C260-01.....Air Entraining Admixtures for Concrete.
- C841-03.....Installation of Interior Lathing and Furring
- C847-04.....Metal Lath
- C897-00.....Aggregate for Job-Mixed Portland Cement Based Plasters
- C926-98 (R2005)Application of Portland Cement-Based Plaster
- C933-2005.....Welded Wire Lath
- C979-05.....Pigments for Integrally Colored Concrete
- C1002-04.....Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
- C. Commercial Item Description (CID):
 - A-A-55615Shield, Expansion (Wood Screw and Lag Bolt Self-Threading Anchors)
- D. Federal Specifications (Fed Spec.):
 - UU-B-790A.....Building Paper, Vegetable Fiber (Kraft, Waterproofed, Water Repellent and Fire Resistant)

PART 2 - PRODUCTS

2.1 METAL PLASTERING BASES

- A. Expanded Metal Lath:
 1. ASTM C847, zinc-coated (galvanized) except as modified by ASTM C841 and this specification. Self furring where applied over solid backing.
 2. Flat diamond mesh weighing not less than 1.8 kg/m² (3.4 pounds per square yard).
 3. Stucco Mesh: Flat expanded diamond mesh pattern, with openings approximately 38 by 75 mm (1-1/2 by 3 inches), weighing not less than 1.9 kg/ m² (3.6 pounds per square yard), with backing as specified.
- B. Wire Lath:
 1. Zinc coated (Galvanized).
 2. Welded Wire Lath: ASTM C933, with backing as specified.
 3. Self furring where applied over solid backing.
- C. Building Paper Backing for Metal Plastering Bases:
 1. Backing attached to lath as specified in ASTM C933.
 2. Vapor Permeable Backing: Fed. Spec. UU-B-790, Type I, Grade D.
 3. Water Resistant Backing: Fed. Spec. UU-B-790, Type I, Grade B.

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2.2 ACCESSORIES FOR CEMENT PLASTER (STUCCO)

- A. ASTM C841, except fabricate from 0.69 mm (0.027 inch) thick zinc alloy.
- B. Control Joints: ASTM C841, 0.69 mm (0.027-inch) thick zinc.

2.3 FASTENERS

- A. Tie, wire, screws, clips, and other fasteners ASTM C841, except as otherwise specified.
- B. Fasteners for securing metal plastering bases shall have heads, or be through washers large enough to engage two strands of the metal plastering base.
- C. For fire rated construction; type and size as used in fire rated test.
- D. Screws: ASTM C1002.
- E. Expansion Shields: CID A-A-55615, of the Type and Class applicable.

2.4 CEMENT

- A. Portland: ASTM C150, Type I.
- B. Masonry: ASTM C91. Lime where added, ASTM C207, Type S.
- C. White where required for white finish coat.

2.5 LIME

- A. ASTM C206, Type S.
- B. ASTM C207, Type S.

2.6 AGGREGATES (SAND)

- A. ASTM C897, graded as required to suit texture of finish specified.
- B. White where white finish coat is specified.

2.7 BONDING AGENT

- A. ASTM C932.

2.8 FACTORY PREPARED FINISH COAT FOR CEMENT PLASTER (STUCCO)

- A. Factory prepared dry blend of materials, integrally colored, designed for exterior finish coat application.
- B. Pigments: ASTM C979, lime proof mineral oxide.
- C. Not more than 35 percent, by weight of all ingredients (cement, aggregate, hydrated lime, admixture and coloring pigment) shall pass a number 100 sieve.

2.9 ADMIXTURES

Air Entrainment: ASTM C260.

PART 3 - EXECUTION

3.1 METAL PLASTERING BASES (LATH) LOCATIONS

- A. Where plaster is required on solid concrete or masonry bases, metal plastering bases are not required, unless shown on the drawings. Where shown use wire lath or stucco mesh.
- B. On ceiling or soffit framing use flat diamond mesh lath.

- C. On interior wall framing:
 - 1. Use flat diamond mesh lath.
 - 2. Use lath with water resistant backing in wet areas.
- D. Over steel columns, use self-furring flat diamond mesh lath.
- E. Where metal plastering bases are used as a base for exterior cement plaster over wall sheathing, use wire lath or stucco mesh with water resistant backing.

3.2 APPLYING METAL PLASTERING BASES

- A. In accordance with ASTM C841, except as otherwise specified or shown.
- B. Form true surfaces, straight or in fair curves where shown, without sags or buckles and with long dimension of lath at right angles to direction of supports.
- C. Lath for ceiling or soffit construction shall terminate at casing bead (floating angle construction) at perimeter angles between walls and ceilings or soffits.
- D. Lath with backing shall be applied to produce a paper to paper and metal to metal lap at ends and sides of adjacent sheets, whether full sheets or less than full sheets are used.
 - 1. Backing shall be lapped 50 mm (2 inches) for both horizontal and vertical laps.
 - 2. Horizontal laps shall be ship lap fashion to conduct water to the outside and over flashing or waterproofing.
- E. Metal plastering bases shall not be continuous through expansion and control joints, but shall be stopped at each side.
- F. Attach metal lath directly to masonry and concrete with hardened nails, power actuated drive pins or other approved fasteners. Fasteners shall be located at the dimples or crimps only.
- G. Wood plugs are not acceptable.

3.3 INSTALLING PLASTERING ACCESSORIES

- A. Install accessories in accordance with ASTM C841, except as otherwise specified.
 - 1. Set plastering accessories plumb, level and true to line, neatly mitered at corners and intersections, and securely attach to supporting surfaces as specified for metal lath.
 - 2. Install in one piece, within the limits of the longest commercially available lengths.
- B. Corner Beads: Install at all vertical and horizontal external plaster corners, as required to establish grounds, and where shown.
- C. Strip Lath:
 - 1. Install metal lath strips centered over joints between dissimilar materials, such as hollow tile, brick, concrete masonry units, concrete, and joints with metal lath on framing or furring, where both such surfaces are required to be plastered and are in contact with each other in same plane, except where expansion joints and casing beads are required.
 - 2. Wire tie or fasten strip lath to base along both edges at not over 150 mm (six inches) on centers.
- D. Casing Beads:
 - 1. Install casing beads where shown and at following locations where plaster terminates to provide finish trim.
 - 2. Where plaster terminates against non-plastered surfaces such as masonry, concrete, and wood.

3. Where plaster terminates against trim of steel frames and trim of other materials and equipment, except where trim overlaps plaster.
4. Around perimeter of openings except where edge is covered by flanges. Locate to conform to dimensions shown on shop drawings.
5. Where plaster for new walls or furring (vertical or horizontal) terminates against existing construction.
6. Both sides of expansion and control joints unless shown otherwise.
7. Install casing bead at perimeter angles between walls and ceilings so as to provide floating angle (unrestrained) construction in accordance with ASTM C841.

E. Cornerites:

1. Install at interior corners of walls, partitions, and other vertical surfaces to be plastered, except where metal lath is carried around angle.
2. Fasten only as necessary to retain position during plastering.
3. Omit cornerites at junction of new plastered walls with existing plastered walls at locations where casing beads are specified.

F. Control Joints:

1. Where control joints are placed parallel to framing members, install joints within 100 mm (four inches) of the framing member.
2. Install control joints only to the edges of abutting sheets of lath so that the lath is not continuous or tied across the joint.
3. Joints shall extend the full width and height of the wall or length of soffit/ceiling plaster membrane.

3.4 SURFACE PREPARATION OF SOLID BASES

- A. Surfaces that are to receive plaster shall be prepared and conditioned in accordance with ASTM C926, except as otherwise specified.
- B. New surfaces of masonry and concrete:
 1. Remove projections and clean concrete surface of form oil.
 2. Fill depressions, holes, cracks and similar voids flush with Portland cement plaster to provide substrate within the tolerance specified in ASTM C926.
 3. Use bonding agent.
 4. Cover with self furring lath where required to keep the total plaster thickness as specified in Table 4 of ASTM C926.
- C. Existing surfaces of concrete and masonry:
 1. Clean surface of dirt and other foreign matter which will prevent bond.
 2. Apply dash bond coat or bonding agent as specified herein.
 3. Where existing surfaces have a coating such as paint or bituminous waterproofing apply metal plastering base as specified herein.

3.5 PORTLAND CEMENT BASED PLASTER

- A. Provide portland cement based plaster where cement plaster (stucco) is shown and specified, and as follows:

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1. Three coat work shall be used over all metal plastering bases, with or without solid backing.
 2. Two coat work may only be used over solid bases meeting the requirements of Paragraph, SURFACE PREPARATION OF SOLID BASES.
- B. Proportion, mix and apply plaster in accordance with ASTM C926, except as otherwise specified.
1. Use air entrained plaster for all exterior work.
 2. Use coloring pigment for finish coat.
 3. Use white cement with white sand when white finish coat is specified.
 4. Factory prepared finish coat: Add water, mix, and apply as specified by manufacturer.
 5. Color:
 - A. Color To Be Selected By COMMISSIONER Upon Submission Of Pigment Color Chart.
 6. Finish coat shall be sand float.

END OF SECTION

SECTION 09250
GYP SUM 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 is not limited to, the following:
1. Gypsum board work for partitions, ceilings, column enclosures, furring, and elsewhere where gypsum drywall work is shown on drawings.
 2. Metal supports for gypsum drywall construction.
 3. Acoustical insulation for gypsum drywall work.
 4. Sealant for gypsum drywall work.
 5. Concealed metal reinforcing for attachment of railings, toilet partitions and other items supported on drywall partitions and walls.
 6. Taping and finishing of drywall joints.
 7. Installing rings and frames in drywall surfaces for grilles, registers and lighting fixtures.
 8. Bracing and connections.

1.3 QUALITY ASSURANCE

- A. The following standards as well as other standards which may be referred to in this Section, shall apply to the work of this Section:
1. Gypsum Drywall Construction Handbook, latest edition, U.S. Gypsum Co.
 2. ASTM C645 "Standard Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels For Screw Application of Gypsum Board".
 3. ASTM A568 "Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements For".
 4. ASTM C36 "Standard Specification for Gypsum Board".
 5. ASTM C442 "Specification for Gypsum Backing Board and Coreboard".
 6. ASTM C600 "Specification for Water Resistant Gypsum Backing Board".
 7. ASTM C475 "Standard Specification for Joint Treatment Materials For Gypsum Wallboard Construction".

8. ASTM C840 "Standard Specification for Application and Finishing of Gypsum Board".
 9. ASTM C919 "Standard Specification for Use of Sealants in Acoustical Applications".
 10. ASTM C954 "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".
 11. ASTM C1002 "Standard Specification for Steel Drill Screws For the Application of Gypsum Board".
 12. ASTM C754 "Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Board".
- 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
1. 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.
 - a. 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 E119 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.
- E. Installer: Firm with 3 years of successful experience in the installation of specified materials.

1.4 SUBMITTALS

- A. Manufacturer's Literature: Submit technical and installation instructions for each drywall partition, furring and ceiling system specified herein, and for each fire rating and sound rating. gypsum board assembly. Submit other data as required to show compliance with these specifications.
- B. Test Reports: This Contractor shall submit test report, obtained by drywall manufacturer, indicating conformance of drywall assemblies to required fire ratings and sound ratings.

1.5 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.

1.6 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.

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 Domtar 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 at fire rated partitions shall be "Fire Trak" made by the Fire Trak Corp. fabricated of 20 ga. galvanized steel.
3. "J" Type: Formed from 20 U.S. Std. gauge galvanized steel, 1" x 2-1/2" or 4" wide (to suit detail).

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 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. 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. *System shall comply with the performance parameters of USG Drywall Suspension System; MEA 312-99-M or MEA 123-00-M, as required for application.*

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 C645.
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.

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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: 5/8" thick, "Sheetrock", OR APPROVED EQUAL, 48" wide, in maximum lengths available to minimize end to end butt joints.
- B. Fire Rated Gypsum Wall Board: 5/8" thick as indicated on drawings, "Sheetrock Firecode C", OR APPROVED EQUAL, 48" wide, in maximum lengths available to minimize end to end butt joints.
- C. Water Resistant Gypsum Wall Board (for ALL TILE AREAS INCLUDING toilet rooms) and where else indicated: 5/8" thick, "Sheetrock W/R" or "Sheetrock Firecode C W/R", OR APPROVED EQUAL, 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, thickness TO MATCH STUD DEPTH, in walls (unless otherwise indicated), 3 lb./cu. ft. maximum density; USG's "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 3.00 - Execution" Articles and as recommended by drywall manufacturer.
- C. Laminating Adhesive: "Perf-A-Joint Compound Taping".
- 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: "Metal Trim No. 200-A", 28 U.S. Std ga. galvanized steel, channel type, or "Metal Trim No 200- B", L type, where use of channel type (200--A) not possible.
- F. Metal Trim Treatment Materials and Joint Treatment Materials for Gypsum Drywall Boards: "Perf-A-Tape" for joint reinforcing; "Durabond 90 Joint Compound-Multi-Purpose" for taping and topping; and "Ready Mixed Compound-Topping" for finishing.
- G. Water: Clean, fresh and suitable for drinking.
- H. Control Joints: No. 93, USG.
- I. Acoustical Sealant: USG "Acoustical Sealant" or "Tremco Acoustical Caulking" of Tremco Mfg. Co., or approved equal.
- J. Neoprene Gaskets: Conform to ASTM D1056.

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 deck/slab above.
3. Spot-grout in metal door frames at the jamb-anchor clips with joint compound after the studs are installed and just before the wallboard is installed. If second layer of wallboard is indicated, rake out compound after installing first layer of wallboard. Grout frames in solid for door jambs where indicated.
4. 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. 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.

D. Wall Board Application

1. 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.
2. Apply wallboard with long dimension parallel to stud framing members, and with abutting edges occurring over stud flanges.
3. Install wallboard for partitions from floor to underside of structure above and secure rigidly in place by screw attachment, unless otherwise indicated.
4. Neatly cut wallboard to fit around outlets, switch boxes, framed openings, piping, ducts, and other items which penetrate wallboard; fill gaps with acoustic sealant.
5. 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.
6. 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.
7. Where studs are doubled-up, screw fasten wallboard to both studs in a staggered pattern.

E. 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.

F. 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. Ceiling dimensions exceed thirty (30) feet in either direction.
4. Wings of "L", "U", and "T" shaped ceiling areas are joined.
5. Expansion or control joints occur in the structural elements of the building.

6. Partition or furring abuts a structural element or dissimilar wall or ceiling.
7. Partition or furring runs exceed 30' without interruption.
8. 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.

G. 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 twenty four (24) inches o.c. maximum. Fasten furring channels to concrete or masonry surfaces with power-driven fasteners or concrete stub nails spaced twenty four (24) 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 twenty four (24) inches o.c. At toilet areas and all gypsum drywall partitions indicated to receive ceramic tile, space studs sixteen (16) inches o.c.
 2. Anchor studs to floor runners with screw fasteners. Provide snap-in 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.

- a. At fire rated partitions use Fire Trak ceiling runners with firestopping mineral wool meeting the requirements of Section 07270 and additional drywall cover plates to meet appropriate U.L. design.
 3. Connection at ceiling runner for non-rated partitions shall be 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. 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.
 5. At jambs of door frames and borrow 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.
 6. 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.
 7. 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 instruction. 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: 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 stud and bolted fastener, or other anchorage device approved by COMMISSIONER.

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.

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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) or with two (2) strands of sixteen (16) ga. galvanized soft steel tie wire (saddle tied to main runner channel). 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 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 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.

3.7 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. 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 CITY OF NEW YORK.

3.8 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 COMMISSIONER.
- 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.

3.9 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

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SECTION 09310

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 tile as shown on the drawings and/or specified herein, including, but not limited to, the following:

1. Glass Tile
2. Saddles.
3. Floor tile.
4. Setting beds, grout, sealant and waterproof membrane.

1.3 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 137.1.
2. Install all tile in accordance with the recommendations contained in Handbook for Ceramic Tile Installation of the Tile Council of America, Inc., latest edition.

1.4 SUBMITTALS

A. Samples

1. Before any tile is delivered to the job site, submit to the COMMISSIONER sample panels, approx. 24" x 24", 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 saddles.

B. Master Grade Certificates: Prior to opening ceramic tile containers, submit to the COMMISSIONER 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.

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. (10 deg. C.) in tiled areas during installation and for 7 days after completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS: Provide products manufactured by Stone Source, Spec Ceramics, Modwalls, italics stone or approved equal. The following names and model numbers are those of Stone Source; other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

2.2 BATHROOM WALL TILE

A. SPECIFICATION: Provide Mesh mounted 5/16" Glacier Glass Tiles in size and color below. Provide Gloss/Polished Finish.

1. TYPE "A" • On fixture wall, 2" x 2" stack bond wall tiles. COLOR: C7

2. TYPE "B" • All other walls, 1" x 2" wall tiles. COLOR: 04 Mint, 05 Evergreen; 06 Ice, 35 Citrine. Equal percentages, random factory mix.

2.3 FLOOR TILE

A. TYPE "C" • Provide APAVISA High Technical Porcelain tile.

B. Designation Color

| | |
|------|--|
| F006 | LAVA Collection, colors: ANTRACITA (60cm x 60cm).
FINISH: NATURAL . |
|------|--|

| | |
|------|--|
| F007 | LAVA Collection, colors: NEGRO (60cm x 60cm).
FINISH: NATURAL . |
|------|--|

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 STONE SADDLES

- A. Provide sound Group "A" GRAPHITE slate, Honed finish, min. 3/4" thick, with an abrasive hardness of not less than 10.0, when tested in accordance with ASTM C241. Cut saddle to fit jamb profile, honed finish.

2.6 GLASS TILE MATERIALS/PROCEDURES

- A. Provide materials and procedures, as recommended by manufacturer, including the following:

- A. Underlayment should be either fully cured concrete or properly installed cement backerboard, and must be dry, stable, flat and free of foreign substances, with no risk of water seepage.
- B. Recommended adhesive is white colored Laticrete 4237 Latex Thin-Set Mortar Adhesive, used with Laticrete 211 Crete Filler Powder, or Laticrete 254 Platinum Thin-Set, mixed with water. Apply a thin layer of adhesive, spreading the adhesive smoothly in order to enable it to dry evenly. Back-butter each tile to ensure full coverage with adhesive. Do not use a jagged edge applicator. Existing joints in subsurface must be carried through tile work. Expansion joints should be installed at all "changes of plane" and where tile abuts restraining surfaces.
- C. Recommended grout joint width is at least 1/8". For 1/8" joints, grout with un-sanded grout, Laticrete 1600 series. For joints larger than 1/8", use sanded grout, Laticrete 1500 series or SpectraLock Pro. Silicone caulking sealant must be installed in all corner joints in the place of grout. Follow manufacturer's installation instructions. Laticrete offers a ten year Labor and Material Warranty upon adherence to the above recommendations.
- D. Cutting Tiles: Use a standard new, sharp blade suitable for cutting glass tiles, which must be constantly kept wet with water. Cutting the pieces with the colored surface turned upwards and taping both sides will reduce chipping. Cutting must not be carried out near the edges of the individual pieces. Smooth off any sharp edges with sandpaper. Holes can be made with a specific drill bit for glass with a diameter up to 5/16". Apply water continually while drilling.

2.7 SETTING BEDS AND GROUT

- A. Portland Cement: ASTM C150, Type I.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Sand: ASTM C144, clean and graded natural sand.
- D. Latex Additive: As manufactured by Laticrete, Mapei, H.B. Fuller or approved equal.
- E. Wall and Base Tile
 - 1. As permitted by manufacturer, 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. As permitted by manufacturer, over masonry and concrete use a mortar leveling coat followed by a Dry-Set Latex modified Portland Cement Bond Coat conforming to TCA Detail W-211.

F. Floor Tile and Saddle - Thin Set: As permitted by manufacturer, set floor tile and saddle using latex modified dry set Portland Cement bond coat conforming to TCA Detail F-113.

G. Water: Clean, fresh and suitable for drinking.

H. Grout

1. For grouting ceramic tile, provide a commercial Portland cement grout made by Laticrete, Mapei, or approved equal; color as selected by the COMMISSIONER. Add latex additive to grout made by same manufacturer as grout.

I. 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.

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

1. 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. 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.

B. Seal substrate with sealer as recommended by manufacturer of mortar or adhesive.

3.4 JOINTS IN TILE WORK

- A. Joint Widths: As recommended by manufacturer.
- B. Alignment: Wall, base and floor joints shall align through the field and trim. Direction and location of all joints as directed by COMMISSIONER.
- C. Control Joints: Locate where control joints are in back-up material. Provide control joint at joints between mop receptors and ceramic tile. Provide control joint at all vertical internal joints of wall tile. Control joints 1/8" wide in ceramic tile. Fill all control 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.
- D. Provide vertical and horizontal movement joints in accordance with TCA detail EJ171.

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 masonry or concrete using dry set mortar - ANSI A108.1 and A108.10.
 - 3. Floor tile using dry set mortar - 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. Handle, store, mix and apply setting and grouting materials in compliance with the manufacturer's instructions.
- D. 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.
- E. 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.
- F. 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.

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3.6 INSTALLATION SADDLES

- A. Install 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 09660
RESILIENT TILE 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 tile flooring, as shown on the drawings and/or specified herein, including but not limited to, the following:
1. Cork rubber tile.
 2. Vinyl base.
 3. Transition strips.
 4. Accessories.

1.3 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.

1.4 SUBMITTALS

- A. Manufacturer's Data: For information only, submit manufacturer's technical information and installation instructions for type of resilient tile.

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 and strips.

1.5 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.

1.6 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 MANUFACTURERS: Provide products manufactured by Expanko, Capri Cork, Zandur or approved equal. The following names and model numbers are those of Expanko; other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

2.2 TILE

A. Cork Rubber: Standard Roll, 49.5" x 50' x 1/8" thick, XCR4 cork rubber flooring. Provide colors as follows:

| <i>Designation</i> | <i>Color</i> |
|--------------------|--------------------------|
| F001 | Steel Gray (Light Gray) |
| F002 | Gravel (Medium Gray) |
| F003 | Charcoal (Dark Gray) |
| F004 | Mint Julip (Light Green) |
| F005 | Olive (medium Green) |

2.3 BASE

A. Provide four (4) inches high, 1/8" thick, continuous vinyl, top set cove base with pre-formed internal and external corner pieces, color(s) as selected by the COMMISSIONER. For areas to receive carpet, provide flat base, no cove. Base shall conform to Fed. Spec. SS-W-40, Type II, as manufactured by Flexco, Mercer Plastics, Armstrong, or approved equal. Color: to be selected by COMMISSIONER (allow for 3 different colors).

2.4 ACCESSORIES

A. Adhesives: Waterproof, stabilized type, as recommended by the tile manufacturer for the type of service indicated.

B. Concrete Slab Primer: Non-staining type recommended by the tile manufacturer.

2.5 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 meeting product specifications.

A. Edging Strips: 1/8" thick, homogeneous vinyl or rubber composition, tapered or bullnose edge, color as selected by the COMMISSIONER from manufacturer's standards.

- B. Surface Sealer: Provide surface applied tile sealer/coating as recommended by the manufacturer for both cork and cork rubber materials. Application to cork rubber tile prevents the cork component from discoloring due to dirt and general use.**

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.
- D. Level existing surfaces as required to accommodate new tile installation.

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.

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- 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 are 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. Bases: In all spaces where base is indicated, install bases 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 in accordance with manufacturer requirements.

END OF SECTION

SECTION 09685
TILE CARPETING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide all tile carpeting as indicated on Drawings and as specified herein, including carpet adhesives, underlayment, accessories and temporary protection.

1.2 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. American Society of Testing and Materials (ASTM), latest editions.
 - D1335 Test Method for Tuft Bind of Pile Yarn Floor Coverings.
 - D2646 Test Methods for Backing Fabric Characteristics of pile yarn floor coverings.
 - D3936 Test Method for resistance to delamination of the secondary backing of pile yarn floor covering.
 - D6859 Test method for pile thickness of finished level pile yarn floor coverings.
 - D7330 Test method for assessment of surface appearance change in pile floor coverings using standard reference scales.
 - D5116 Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products
 - E648 Test method for critical radiant flux of floor covering systems using a radiant heat source.
 - F710 Practice for preparing concrete floors to receive resilient flooring
2. New York City Building Code, latest edition.
3. American Association of Textile Chemists and Colorists (AATCC), latest edition.
4. American National Standards Institute/NSF International.

ANSI/NSF 140-2005: Sustainable carpet assessment standard.

5. Code of Federal Regulations

40 CFR 59, Subpart D-2002: National Volatile Organic Compound Emission Standards for Architectural Coatings.

6. National Fire Protection Association (NFPA)

NFPA 253 Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source

7. Carpet and Rug Institute (CRI)

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product literature and installation instructions for each type of carpeting material, adhesive and installation accessory required. Include method of installation.

1. Submit written data on physical characteristics, durability, resistance to fading and flame resistance characteristics.

B. Shop Drawings: Submit carpet tile layout and pile-direction pattern drawings for each area to receive carpet. Drawings shall show the following:

1. Carpet manufacturer, styles, patterns, and colors.

2. Pile Direction.

3. Pattern of Installation.

4. Pattern type, location and direction.

5. Types, colors, details and location of edge guards, reducing strips and other accessories.

6. Columns, partitions, built in equipment and cabinets, doors, recesses and other items that require cutouts to be made in the carpet.

7. Transition details to other flooring materials.

C. Samples

1. Carpet

a. Submit manufacturers complete range of sample sets for each type of carpet tile specified for color and pattern selection.

b. Submit three (3) full size samples of carpet tile for each type and color selected.

c. Label samples, stating color, pattern, weight/sq.yd., density, pile height, location where to be installed (room and school) and manufacturer's name.

2. Carpet Reducer and Edge Strips: two pieces of each, 12" in length, min.

D. Material Certificates

1. Submit certificates from the manufacturers of the specified materials stating compliance with the applicable requirements set forth for all materials specified in this Section.

2. For carpet tile, documentation indicating compliance with testing and product requirements of Carpet and Rug Institute's "Green Label Plus" program.

E. Warranties: Submit warranties per Article 1.7 of this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications

1. Certify that Installer is experienced in the supervision of carpet tile installation with at least five years experience in this type of Work and who is certified by the International Certified Floorcovering Installers Association at the Master II certification level.

2. Actual work shall be done by qualified and experienced mechanics working under his supervision or under the supervision of an experienced workroom supervisor who has also been doing this type of Work for five years.

B. Regulatory Requirements

1. Fire Performance Characteristics: Provide carpet tiles and adhesive, that has been tested for the following fire performance requirement.

a. Critical Radiant Flux: As follows:

1) Rating: Not less than 0.22 watts per sq. centimeter per Section BC 804.4.1 of the 2014 NYC Building Code

2) Test Method: ASTM E648 or NFPA 253.

2. VOC emission Limits

a. VOC limit of Table 1 of Chapter 14 of Title 17 of the NYC Administrative Code (Local Law 2/2012) as required by Section BC 804.5.

b. Test Method: ASTM D5116.

- 3. Carpet and Rug Institute's "Green label plus"

C. Certifications

- 1. Submit certified independent laboratory testing data indicating that material meets requirements for Fire Resistance specified above, in accordance with N.Y.C. Building Code Requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original bundles, clearly labeled with name of manufacturer, brand name, quality or grade and lot number.

1.6 PROJECT CONDITIONS

- A. Do not deliver or install carpet tiles until spaces are enclosed and weathertight.
- B. Maintain room temperature at minimum 60°F for at least 24 hours prior to installation.
- C. Do not install carpet tiles over concrete substrate until concrete has cured 30 days minimum.
- D. Do not install the carpet tiles until painting and finishing work has been completed.

1.7 WARRANTIES/GUARANTIES

- A. Submit copies of manufacturer's product warranties for each product specified.
- B. Contractor shall furnish a warranty/guarantee to include: Five (5) year unconditional guarantee covering satisfactory workmanship, materials and installation, starting from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. FORBO CARPET, Assendelft, Netherlands
- B. INTERFACE, LaGrange, GA
- C. ANKER-TEPPICHBODEN, Düren, Germany
- D. APPROVED EQUAL

2.2 MATERIALS: Equal to Forbo Westbond Fusion Bonded Carpet Tile

- A. Carpet
 - 1. Carpet Fiber: Nylon.
 - 2. Carpet Thickness: 8.1 mm
 - 3. Carpet Pile Height: 5 mm
 - 4. Tile Size: 50cm x 50 cm
 - 5. Colors:

| <i>Designation</i> | <i>Color Name</i> | <i>Color Number</i> |
|--------------------|-------------------|---------------------|
| | | |

| | | |
|------|-------------------|---------|
| F006 | Flex -Orange Peel | NF92141 |
| F007 | Flex -Hailstone | NF92193 |

2.3 ACCESSORIES

A. Adhesive

1. As recommended by manufacturer of carpet for direct glue down applications. Comply with fire performance requirements for carpet.
2. All adhesives used shall comply with V.O.C. requirements as stated in Specification Section G01600.

B. Carpet Edge Strip

Heavy-duty vinyl carpet edge strip as manufactured by Burke Flooring, San Jose, CA. or Stoler Industries/All State Rubber Corp., Dalton, GA., minimum 2" wide anchorage flange. Colors as selected by Architect.

C. Carpet Reducer Strip

Solid heavy-duty vinyl carpet reducer strip as manufactured by Burke Flooring, San Jose, CA. or Stoler Industries/All State Rubber Corp., Dalton, GA., minimum 1/2" tapered. Colors as selected by Architect.

D. Patching Compound

Type as recommended by carpet manufacturer.

E. Floor Filler

Type as recommended by carpet manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for moisture content and other conditions under which tile carpeting is to be installed. Notify the Authority in writing of major conditions detrimental to proper completion of the Work. Do not proceed until unsatisfactory conditions have been corrected as start of Work constitutes acceptance that all conditions are satisfactory.
- B. For concrete subfloors, verify that concrete slabs comply with ASTM F710 and the following:
 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that

may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.

2. Subfloors are free of cracks, ridges, depressions, scale and foreign deposits.

C. Installation of carpet tiles will signify the Contractor's acceptance of the substrate as satisfactory to receive his work.

3.2 PREPARATION

A. Repair minor holes, cracks, depressions, and rough areas using material recommended by carpet or adhesive manufacturer.

B. Clear away debris and scrape up cementitious deposits from surfaces to receive carpet tiles; vacuum clean immediately before installation. Check concrete surfaces to ensure no dusting through installed carpet tiles; apply sealer where required to prevent dusting.

C. Install carpet tiles prior to installation of cabinets, furniture or demountable partitions and after all other trades, including painting, have completed their work.

3.3 CARPET TILES INSTALLATION GENERAL

A. Maintain dye lot integrity. Do not mix dye lots in same area.

B. Extend carpet under open-bottomed obstructions and under removable flanges and furnishings.

C. Provide cut-outs where required for recesses, and bind cut edges properly where not concealed by protective carpet edge strips or overlapping flanges.

D. Provide carpet edge strips where edge of carpet is exposed; anchor edge strips to substrate.

E. Provide reducer strips to meet conditions where carpet meets other flooring materials.

3.4 GLUE-DOWN INSTALLATION

A. Fit carpet tiles into each space prior to application of adhesive. Trim edges and butt cuts with seaming cement.

B. Apply adhesive uniformly, to comply with manufacturer's instructions. Butt carpet edges tightly to form seams without gaps. Promptly remove any adhesive from carpet by an approved method.

C. Unless otherwise approved by the carpet installer, allow glue-down installation a minimum of 48 hours to cure before subjecting it to any traffic, moving of furniture or final cleaning

3.5 ADJUSTMENTS

- A. Included in the Work of this Contract as part of the Warranty stipulated in Art. 1.07 is the provision that the carpet subcontractor shall repair seams, joints and edges, after installation is completed
 - 1. The Authority shall determine if and when this Work is required, but it shall be within 12 months after final approval of finished installation.
 - 2. Contractor will be notified fourteen (14) days prior to the time he would be required to return to the site for this repair work
 - 3. Provide service telephone number to the Authority's Representative (who will submit it to the custodian).

3.6 CLEANING

- A. Immediately remove spots and smears of cement from carpet tiles with solvent.
- B. Upon completion of installation, remove all tools and equipment and dispose of all waste and excess materials. Carefully and thoroughly vacuum clean the entire floor areas using a commercial type vacuum cleaner with a face-beater element satisfactory to the Authority.
- C. All excess carpet tiles that are in good condition and can be used for repairs are to be left on the job site and placed in an orderly manner in an area designated by the Authority's Representative (who will submit them to the custodian).

3.7 PROTECTION

- A. Upon completion and final inspection by the Authority, provide reinforced Kraft paper runners 36" wide at all traffic areas as directed by the Authority.
- B. Prior to final inspection, no traffic will be allowed on the installed carpet.

END OF SECTION

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SECTION 09720
DIGITAL PRINT WALL COVERING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Wall size Digital Print wallcovering as and installation where shown on the drawings.

1.2 SUBMITTALS

- A. Samples:
 - 1. Sample of print design at 100% (a tile) for review of sharpness and color accuracy, and a printout at reduced scale of the entire design. Both items will be printed on the desired substrate.
- B. Manufacturer's Certificates:
 - 1. Wallcovering manufacturer's approval of adhesive.
- C. Manufacturer's Literature and Data:
 - 1. Primer and adhesive.
 - 2. Installation instructions.
 - 3. Maintenance instructions, including recommended materials and methods for maintaining wallcovering with precautions in use of cleaning material.

1.3 QUALITY ASSURANCE

- A. Finish one complete space with each type (color and pattern) of wallcovering showing specified colors and patterns.
- B. Use approved sample spaces as a standard for work throughout the project.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver in original unopened containers bearing the manufacturer's name, brand name, and product designation.
- B. Store in accordance with manufacturer's instructions.
- C. Handle to prevent damage to material.

1.5 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. Chemical Fabrics and Film Association, Inc., (CFFA):
2575-96(R2011).....Vinyl Coated Fabric Wallcovering

- C. American Society for Testing and Materials (ASTM)
G21-09Determining Resistance of Synthetic Polymeric Materials to Fungi

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Wolf Gordon; WG Customs Lab
- B. Maharam Digital Projects
- C. Roysons
- D. Approved Equal

2.2 SUBSTRATE

- A. Performance objective for Substrate type and emboss shall be durable and cleanable as suited for public use spaces. UV-resistant inks on a washable, latex-reinforced substrate for direct wall application.

PART 3 - EXECUTION

- 3.1 COMMISSIONER will provide an actual size, 50-100 dpi (70+ dpi preferred) rasterized Photoshop file to manufacturer. WG Custom Lab shall assess and modify image as required for the application.

- 3.2 COLOR SPACES for working with files are RGB for digital photographic output (Lambda) and CMYK SWOP coated 20% for digital ink based output (Vutek). All pixel-based imports must be saved as CMYK or RGB in a TIFF or EPS format. For optimal color accuracy the files shall either be created in or converted to CMYK before submittal. Black and white images should be saved as grayscale. All ICC Color profiles (if used) should be embedded with scans.

- 3.3 MEASUREMENTS: MURAL DIMENSIONS TO BE FIELD VERIFIED AND ANY ARCHITECTURAL FEATURE OR HARDWARE ELEMENTS THAT NEED TO BE ACCOUNTED FOR IN THE LAYOUT SHOULD ALSO BE INDICATED (HVAC UNITS, PILASTERS, ETC.).

3.4 ENVIRONMENT

- A. Temperature:
 - 1. Do not perform work until surfaces and materials have been maintained at minimum of 60 °F. for three days before work begins or as directed by manufacturer.
 - 2. Maintain minimum temperatures of 60 °F. until adhesives are dried or cured.

- B. Lighting:
 - 1. Do not proceed unless a minimum lighting level of 15 candlepower per square foot occurs.
 - 2. Measure light level at mid-height of wall.
- C. Ventilation:
 - 1. Provide uniform continuous ventilation in space.
 - 2. Ventilate for a time for not less than complete drying or curing of adhesive.
- D. Protect other surfaces from damage which may be caused by this work.
- E. Remove waste from building daily.

3.5 SURFACE CONDITION

- A. Inspect surfaces to receive wallcoverings to assure that:
 - 1. Patches and repairs are completed.
 - 2. Surface are clean, smooth and prime painted.
- B. Do not proceed until defects have been corrected and surfaces are ready to receive wallcovering.
- C. Carefully remove electrical outlet and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, fittings and fastenings, prior to starting work.
- D. Carefully store items for reinstallation.

3.6 APPLICATION OF ADHESIVE

- A. Mix and apply adhesives in accordance with manufacturer's directions.
- B. Prevent adhesive from getting on face of wallcovering.

3.7 WALLCOVERING INSTALLATION

- A. Use wallcovering of same batch or run in an area. Use fabric rolls in consecutive numerical sequence of manufacture.
- B. Install material completely adhered, smooth, clean, without wrinkles, air pockets, gaps or overlaps.
- C. Extend wallcovering continuous behind non-built-in casework and other items which are close to but not bolted to or touching the walls.
- D. Install wallcovering before installation of resilient base. Extend wallcovering not more than 6 mm (1/4 inch) below top of resilient base.
- E. Install panels consecutively in order in which they are cut from the roll including filling spaces above or below windows, doors, or similar penetrations.

- F. Do not install horizontal seams.
- G. Except on match patterns, hang fabric by reversing alternate strips, except as recommended by the manufacturer.
- H. Cutting:
 - 1. Cut on a work table with a straight edge.
 - 2. Joints or seams that are not cut clean are unacceptable.
 - 3. Trim additional selvage to achieve a color and pattern match at seams. Overlapped seams are not allowed.
 - 4. Do not double cut seams on wall unless specified.
 - 5. If double cutting on the wall is necessary, place a three inch strip of Type I wallcovering under pasted edge.
 - a. Do not cut into wall surface.
 - b. After cutting, remove strip and excess adhesive from seam before proceeding to next seam.
 - c. Smooth down seam in adhesive for tight bond and joint.
- I. Trim strip-matched patterns, which are not factory pre-trimmed.
- J. Inside Corners:
 - 1. Wrap wallcovering around corner.
 - 2. Do not seam within 50 mm (2 inches) of inside corners.
 - 3. Double cut seam.
- K. Outside Corners:
 - 1. Wrap wallcovering around corner.
 - 2. Do not seam within 150 mm (6 inches) of outside corners.
 - 3. Double cut seam.

3.8 PATCHING

- A. Replace surface damaged wallcovering in a space as specified for new work:
 - 1. Replace full height of surface.
 - 2. Replace from break in plane to break in plane when same batch or run is not used. Double cut seams.
 - 3. Adjoining differential colors from separate batches or runs are not acceptable.
- B. Correct loose or raised seams with adhesives to lay flat with tight bonded joint as specified for new work.

3.9 CLEANING AND INSTALLING TEMPORARY REMOVED ITEMS

- A. Remove adhesive from wallcovering as work proceeds.
- B. Remove adhesives where spilled, splashed or splattered on wallcoverings or adjacent surfaces in a manner not to damage surface from which it is removed.
- C. Reinstall previously removed electrical outlet and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, fittings and fastenings.

END OF SECTION

SECTION 09900
PAINING 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 gypsum drywall exposed to view.
5. Painting plaster surfaces.
6. Painting of surfaces in existing building.
7. Concrete sealer for exposed floors, columns and ceilings.
8. Painting pipes, pipe coverings, conduit, ducts, insulation, hangers, supports and other mechanical and electrical items and equipment exposed to view.
9. Painting surfaces above, behind or below grilles, gratings, diffusers, louvers, lighting fixtures, and the like, which are exposed to view through these items.
10. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory finished items.
11. 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 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 acoustical tile.
- C. Non-ferrous metals, except for items specified and/or indicated to be painted.
- D. Finished hardware, excepting hardware that is factory primed.
- E. Surfaces not to be painted shall be left completely free of droppings and accidentally applied materials resulting from the work of this Section.

1.4 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' wide, floor to ceiling of wall surfaces, before proceeding with the remainder of the work, for approval by the COMMISSIONER. 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 COMMISSIONER, 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 COMMISSIONER 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.

1.5 SUBMITTALS

A. Materials List

1. Before any paint materials are delivered to the job site, submit to the COMMISSIONER 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 COMMISSIONER.

B. Samples

1. *Accompanying the materials list, submit to the COMMISSIONER manufacturer colors samples for each of the proposed products. These color samples shall be minimum 5" x 9" in size and shall clearly indicate the color and manufacturer identification.*
2. **Prepare a 5' X 5' paint sample of each color on surfaces as directed. The same color may be applied in several different locations. Upon review, the contractor shall be directed to make up to two additional revisions of each color. No additional materials shall be purchased or finish work undertaken until contractor receives approval of the field color samples.**

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 COMMISSIONER's review the current recommended method of application published by the manufacturer of the proposed material.

- D. Submit data indicating that paint meets Performance Standards specified herein.

1.6 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.

1.7 EXTRA STOCK

- A. Upon completion of this portion of the Work, deliver to the CITY OF NEW YORK an extra stock of paint equaling approximately ten (10) percent of each color and gloss used in each coating material used, with all such extra stock tightly sealed in clearly labeled containers.

1.8 JOB CONDITIONS

- A. Apply water-base 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. WOLF GORDON
- B. BEHR

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- C. BENJAMIN MOORE
- D. Contractor's bid shall assume most expensive paint color/finish in manufacturer product line. COMMISSIONER reserves right to select any color/finish in any of manufacturer's product line.
- E. Approved Equal

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. Equal to Scruffmaster, Scrubtough by Wolf Gordon.
- C. Durability: 8,000 Scrubs, in accordance with ASTM D2486
WATERBASED POLYURETHANE ACRYLIC
- D. Colors and Glosses: All colors and glosses shall be as selected by the COMMISSIONER. Certain colors will require paint manufacturer to prepare special factory mixes to match colors selected by the COMMISSIONER. Coloring Pigment: Products of or furnished by the manufacturer of the paint or enamel approved for the work.
- E. Linseed Oil: Raw or boiled, as required, of approved manufacture, per ASTM D234 and D260, respectively.
- F. Turpentine: Pure distilled gum spirits of turpentine, per ASTM D13.
- G. 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.
- H. Driers, Putty, Spackling Compound, Patching Plaster, etc.: Best quality, of approved manufacture.
- I. 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 COMMISSIONER reserves the right to change the finishes within the range of flat, semi-gloss or gloss, without additional cost to the CITY OF NEW YORK.
- 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 COMMISSIONER prior to application of the coating.

2.4 SCHEDULE OF FINISHES

A. Interior Ferrous Metal

Satin Finish/Alkyd

- Primer: 1 coat IronClad Alkyd Low Lustre Metal and Wood Enamel (163),
or touch-up shop primer
- First Coat: 1 coat Satin Impervo (235)
- Second Coat: 1 coat Satin Impervo (235)
 - a. Total DFT not less than: 3.9 mils

Semi-Gloss Finish/Alkyd

- Primer: 1 coat IronClad Latex Low Lustre Metal and Wood Enamel (363),
or touch-up shop primer
- First Coat: 1 coat Alkyd Dulamel (207)
- Second Coat: 1 coat Alkyd Dulamel (207)
 - a. Total DFT not less than: 4.0 mils

B. Interior Drywall and Plaster

Flat Finish/Vinyl Acrylic Latex

- Primer: 1 coat Regal FirstCoat (216)
- First Coat: 1 coat Regal Wall Satin (215)
- Second Coat: 1 coat Regal Wall Satin (215)
 - a. Total DFT not less than: 3.6 mils

Eggshell Finish/Vinyl Acrylic Latex

- Primer: 1 coat Regal FirstCoat (216)
- First Coat: 1 coat Regal AquaVelvet (319)
- Second Coat: 1 coat Regal AquaVelvet (319)
 - a. Total DFT not less than: 3.8 mils

2.5 EXISTING SURFACES TO BE PAINTED

- A. Existing surfaces shall be painted in accordance with schedule given in Article 2.4 herein except that first or prime coat may be eliminated where existing paint is sound. Where existing paint must be removed down to base material, provide first or prime coat as specified.

2.6 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: Alkyd Enamel Undercoater and two (2) coats Alkyd 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 work 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.

2.7 SCHEDULE

Paint colors, broadly described for context below, shall be selected by COMMISSIONER.
[+] sign signifies slightly darker shade – manufacturer to provide sample for approval

***Unless otherwise noted, all wall surfaces shall be paint color P001 and metal doors and frames shall be paint color P001 [+]

| <i>Designation</i> | <i>Paint Color</i> |
|--------------------|---|
| P001 | GOH 10249796 [Warm White] |
| P002 | GOH 10249788 [Medium Gray] |
| P003 | <i>not used</i> |
| P004 | GOH 10249793 [Yellow] |
| P005 | <i>not used</i> |
| P006 | Ceiling White [sim. Benjamin Moore SUPER WHITE] |
| Undesignated | <i>To be selected by COMMISSIONER</i> |

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 COMMISSIONER in writing.

- B. The Contractor shall furnish the COMMISSIONER 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 CITY OF NEW YORK.
- H. All coats shall be dry to manufacturer's recommendations before applying succeeding coats.
- I. All suction spots or "hot spots" in plaster after the application of the first coat shall be touched up before applying the second coat.
- J. 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 COMMISSIONER'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. Plaster Surfaces: Scrape off all plaster nibs or other projections and sand smooth or finish to match adjoining surface texture. Cut out all scratches, cracks, holes, depressions and similar voids and fill with non-shrinking grout, spackles, patching plaster or other approved patching material; allow to dry, refill if necessary, then sand smooth (or refinish) to provide a flush, smooth surface of the same texture as the adjacent plaster surface.

1. Allow at least 28 days, from installation of final plaster coat, before starting work.

E. 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 09250 Gypsum Drywall.

F. 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.

G. Testing for Moisture Content: Contractor shall test all plaster, 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.

H. 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, convector 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.

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.

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- 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 COMMISSIONER.
- 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

SECTION 10350
FLAGPOLE

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide flagpole and flag.
- B. Provide manufacturer furnished pole top light.

1.2 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
 - 1. Aluminum Association (AA).
- B. Structural Performance: Provide flagpoles capable of withstanding the effects of wind loads as determined according to NAAMM FP 1001-07, "Guide Specifications for Design of Metal Flagpoles", or to specified wind speed, whichever is more stringent.
- C. Flagpole Design: Base design on maximum standard size nylon flag suitable for use with pole or flag size indicated, whichever is more stringent.

1.3 SUBMITTALS

- A. Shop Drawings: Show requirements for foundations, connections to adjacent Work, fabrication details and power requirements for pole top light.
- B. Product Data: Catalog sheets, specifications, and installation instructions for flagpoles/flags specified.
- C. Samples: Finish samples for each finished metal used on flagpoles, as may be required.
- D. Contract Closeout Submittals: Operation and Maintenance Data: Submit two (2) copies, covering the installed products, to the CITY OF NEW YORK.

1.4 QUALITY ASSURANCE

- A. Manufacturer: three (3) years minimum experience in manufacture of flagpoles and flags of type specified.
- B. Installer: Three (3) years minimum experience in installation of flagpole and flags of type specified.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle flagpole and accessories as recommended by manufacturer to protect from damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. American Flagpole, Abingdon, VA 24210.
- B. Concord Industries Inc., TX 75001
- C. Or approved equal.

2.2 FLAGPOLE TYPE AND CONSTRUCTION

- A. **Aluminum Flagpole Construction:** Fabricate from seamless, extruded tubing complying with ASTM B 221, alloy 6063-T6, having a tensile strength not less than 30,000 psi with a yield point of 25,000 psi. Heat treat after fabrication to comply with ASTM B 597, temper T6.
 - 1. Provide cone-tapered flagpole, per manufacturer's standard rate of taper.
- B. **Assembly Construction:** Internal Revolving with Winch - Wire Halyard - Ground Set Foundation. Removable winch handle with continuous piano hinged door with compression lock; 25' Height, 2'-6" Set Depth, .188" Wall Thickness, 6" Butt Diameter, 13'-9" Taper Length, one pole section; 185 mph Maximum Wind Speed without flag/ 110 mph maximum wind speed with flag, 5' x 8' Maximum Flag Size.

2.3 MOUNTING

- A. **Foundation Tube:** Galvanized corrugated steel foundation tube, .0635"-16 Gauge (1.6mm) minimum wall thickness, sized to suit flagpole and installation. Provide with 3/16" (4.8 mm) steel bottom plate and steel centering wedges. Furnish with 3/16" (4.8mm) support plate, ." (19 mm) diameter x 18" long steel ground lightning spike. Foundation tube will consist of all welded construction.

2.4 FITTINGS

- A. **LED light integrated Finial (Ornament):** High Intensity, LED, International Dark-Sky Association Dark-Sky Certified down light ball; aluminum satin finish.
- B. **Internal Revolving Truck Assembly:** Cast aluminum two-piece enclosed body, revolving, non-fouling design, single aluminum pulley mounted inside hood, stainless steel roller bearings, brass exit bushing for wire cable, and threaded aluminum spindle for attachment to top of pole. Poles 50' and over will have sealed bearings.
- C. **Internal Halyard Winch System:** Provide one (1) complete internal halyard 1/8" stainless steel wire cable assembly with plastic coated counterweight and beaded sling assembly. A manually operated mechanical winch having automatic brake system and operated with a removable hand crank will be concealed inside the flagpole behind a flush access door having a cylinder lock.
- D. **Halyard Flag Snaps:** Provide two (2) stainless steel swivel snap hooks with neoprene covers.
- E. **Flash Collar:** Provide Spun Aluminum Collar to match flagpole.

2.5 FINISHES

- A. **Metal Finishes, General:** Comply with National Association of Architectural Manufacturers' (NAAMM) "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. **Finish: Anodized Finishes:** Provide Class 1 finish complying with AA M32-C22 A41 (Clear Anodized) in thicknesses ranging from 1 to 3 mils [Anodized - Clear (AA)].

2.6 FLAG

- A. **Material for flag shall be weather resistant, premium nylon, UV resistant fabric.** All seams shall be locked stitched reinforced for maximum durability. Stars shall be precision embroidered or sewn appliqued.
- B. **Flag size shall be in proportion to pole height as permitted by municipal authorities.** If no municipal size/height requirement exists, the following table shall be used to determine flag size.

C.

| Flagpole Height | Size of Flag |
|-----------------|-------------------------------------|
| 20 ft. | 4 ft x 6 ft |
| 25 ft | 5 ft x 8 ft |
| 30-35 ft | 6 ft x 10ft |
| 40-50ft | 6 ft x 10ft min, 8 ft x 12 ft max |
| 50 ft | 8 ft x 12 ft min, 10 ft x 15 ft max |

2.7 FLAGPOLE LIGHT

- A. See light integrated finial ornament above. Flagpole mounted down light shall meet requirements of International Dark-Sky Association's Dark-Sky Certified down light.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect foundations for proper depth and size of sleeve.

3.02 PREPARATION

- A. Paint portions of flagpole below grade with heavy coat of bituminous paint.

3.03 INSTALLATION

- A. Excavation: For foundations, excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete.
- B. Foundation: Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure forms and galvanized steel ground sleeve foundation tube in position, braced to prevent displacement during concreting. Place concrete immediately after mixing. Compact concrete in place using vibrators. Moist-cure exposed concrete for not less than 7 days or use a non-staining curing compound. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks and uniform in texture and appearance. Provide positive slope for water runoff to base perimeter.
- C. Foundation Tube Installation: Install flagpole in foundation tube, seated on bottom plate between steel centering wedges. Plumb flagpole and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube to within 2" of the top of tube. Remove hardwood wedges and seal top of foundation tube with a 2-inch (50 mm) layer of elastometric sealant or cement and cover with flashing collar.
- D. Install flagpoles, flags, base assemblies, cleat and fittings, in compliance with acceptable final Shop Drawings and manufacturer's instructions.
- E. Provide positive lightning ground for flagpole installation.
- F. Provide wiring for flag pole mounted downlight.

3.04 TEST AND ADJUST

- A. Check and adjust installed fittings for smooth operation of halyards.

END OF SECTION

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SECTION 10400
IDENTIFYING DEVICES

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 identifying devices as shown on the drawings and specified herein.

1.3 QUALITY ASSURANCE

- A. For actual installation of the identifying devices, use only personnel who are thoroughly familiar with the manufacturer's recommended methods of installation and who are completely trained in the required skills.

1.4 SUBMITTALS

- A. **Product Data:** Submit manufacturer's technical data and installation instructions for each type of identifying device required.
- B. **Samples:** Submit samples of each identifying device showing finishes, colors, surface textures and qualities of manufacture and design of each sign component including graphics.
- C. **Shop Drawings:** Submit shop drawings for fabrication and erection of identifying devices. Include plans, elevations, and large scale details of sign wording and lettering layout. Show anchorage and accessory items. Furnish location template drawings for items supported or anchored to permanent construction.

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 MANUFACTURERS:

- A. Provide products manufactured by Gemini Signs and Letters , Southwell Co., Signage NewYork or approved equal. The following names and model numbers are those of Gemini Signs and Letters; other manufacturers subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:

2.2 CAST MATERIALS

- A. **Provide 6 1/2" high x 2" depth cast aluminum letters, Gil Sans Light font, "RUGBY LIBRARY" @ vestibule.**

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- B. **Provide 6 1/2" high x 2" depth pin mounted cast aluminum letters, Gil Sans Light font, "ROCHELLE TENNER READING GARDEN" @ concrete retaining wall in reading garden adjacent to Library building. Locate as directed by the City of New York.**
- C. Letters shall be cast from F-214 aluminum alloy with satin polished faces and matte sides.
- D. Letters shall be finished in natural anodized.
- E. Letters shall be mounted flush to surface.
- F. Vestibule letters shall be mounted to aluminum storefront with 1/8" thick neoprene spacer, provided this does not affect performance or maintenance of vestibule. Alternatively, provide min. 1/4" thick mounting plate or angle for text and then mount the entire assembly to storefront. Verify storefront reinforcing provided.

2.3 ETCHED MATERIALS

- A. **Provide custom etched stainless steel signage at book drop, Gil Sans Bold font. Provide text size as shown on drawings etched 1/16" deep into plate surface.**
- B. Plate shall be C304 Stainless steel, thickness as shown on drawings, brushed finish.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where identifying devices 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. Install units and components at the locations directed by the COMMISSIONER, securely mounted with concealed theft-resistant fasteners. Attach to substrates in accordance with the manufacturer's instructions.
- B. Install level, plumb, and at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by the COMMISSIONER.

END OF SECTION

SECTION 10416
TACK BOARD

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 provide and install the tack boards as shown on the drawings and specified herein.

1.3 QUALITY ASSURANCE

- A. For actual installation of the wall covering, use only personnel who are thoroughly familiar with the manufacturer's recommended methods of installation and who are completely trained in the required skills.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of tack board required.
- B. Samples: Submit samples of each tack board type.
- C. Procedures: Submit full installation procedures with certification that they conform to all manufacturer's requirements for installation if the specific product to be used..
- D. Shop Drawings: Show construction, connections, jointing, dimensions, sizes, die numbers of extruded shapes, and other pertinent information. Drawings shall be at 3/4"=1'-0" scale, minimum.

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 FABRIC

- A. Provide XOREL REEF, color: 70, tackable material by Carnegie Fabrics;

2.2 TACKBOARD

- A. 1/4" min. thick cork with rigid hardboard backing.

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2.3 ADHESIVES

- A. Type as recommended by manufacturer of display board and fabric covering.

PART 3 EXECUTION

3.1 All panels shall be shop assembled (off site) under controlled conditions. Do not deliver to site until date of installation. Units to be completely assembled at the shop and erected on a test panel before shipping. All sections to be properly fitted and all units to be thoroughly tested, then taken apart for shipping. Components are to be clearly marked for easy reassembly on the job.

3.2 Panels shall be edge wrapped.

3.3 Provide concealed metal anchors, clips, straps, and other accessories required to properly install the Work.

3.4 PROJECT CONDITIONS

- A. Verify before installation that interior moisture and temperature approximate normal occupied conditions.
- B. Verify that wall surfaces are prepared and ready to receive boards.

3.5 INSTALLATION

- A. Deliver shop fabricated units completely assembled and of dimensions shown in details and accordance with shop drawings as approved by the architect.
- B. Follow manufacturer's instructions for storage and handling of units before installation.
- C. Do not install boards on damp walls or in damp and humid weather without heat in the building.
- D. Install level and plumb, keeping perimeter trim straight in accordance with manufacturer's recommendations.

3.6 ADJUST AND CLEAN

- A. Verify that all accessories are installed as required for each unit.
- B. At completion of work, clean surfaces and trim in accordance with manufacturer's recommendations, leaving all materials ready for use.

3.7 *The above is intended as a guideline; fabricator/ installer has final responsibility for fabrication quality and proper installation.*

END OF SECTION

SECTION 10500
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. Trim, closures, anchors and accessories.

1.3 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 as produced by a single manufacturer, including necessary mounting accessories, fittings and fastenings.

1.4 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 COMMISSIONER. 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.

1.5 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 MANUFACTURER

- A. Legacy Lockers, Dallas, TX
- B. Global Industrial, Port Washington, NY
- C. Ideal Products, Ontario, CA
- D. Or approved equal.

2.2 MATERIALS

- A. 84" h x 12" w x 20" deep, stack two high (VIF space dimensions), Z2 configuration inset lockers (6 lockers total; notched, interlocking door profile); 3/4" Wilsonart "fashion grey" Plastic Laminate with a 2mm PVC edgeband, grey melamine interior; stainless steel mechanical keyless lock (User sets their own four digit code, places items inside the locker, closes locker door, turns

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to locked position and spins the numbers Re-enter the code and turn the lock to open - close the door when leaving; Manager key rotates the numbers to the current combination); brushed silver rod and hooks; adjustable shelf for lower locker tier; door face locker number (Helvetica/Arial font)

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 lockers at locations shown in accordance with manufacturer's instructions for plumb, level, rigid and flush installation.
- B. Install trim, and filler panels using concealed fasteners to provide flush, hairline joints against adjacent surfaces.

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 10522
FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide fire extinguishers, cabinets and accessories as indicated on Drawings and as specified herein.

1. Corridors and Lobbies: Multipurpose Dry Chemical (rated A, B, C) - 20 pounds.
2. Computer MDF Room, Program Offices, Telecommunication Closets, and other areas containing large amounts of electrical wiring: Carbon Dioxide - 10 pounds.

1.2 REFERENCES

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work

1. Underwriters Laboratories, Inc. (UL)
2. Warnock Hersey
3. American Society for Testing and Materials (ASTM)
4. Uniform Building Code (UBC)

1.3 SUBMITTALS

A. Product Data:

Brochure of product, accessories, and installation details. Include rating and classification

B. Shop drawings:

Location of fire extinguisher and cabinets by type.

C. Samples

1. For Initial Selection: For fire-protection cabinets with factory-applied color finishes.
2. For Verification: For each type of exposed factory-applied color finish required for fire-protection cabinets, prepared on Samples of size indicated below.

a. Size: 6 by 6 inches (150 by 150 mm) square.

E. Maintenance Data:

For fire extinguishers and fire-protection cabinets to include in maintenance manuals.

F. Warranty as specified in Article 1.07.

1.4 QUALITY ASSURANCE

A. Fire Extinguisher

Bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

B. Source Limitations: Obtain fire extinguishers and fire-protection cabinets through one source from a single manufacturer.

1.5 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products as recommended by manufacturer to protect from damage.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of portable fire extinguishers that fail in materials or workmanship within six years from date of Substantial Completion.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10.

b. Faulty operation of valves or release levers.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. J. L. Industries, Bloomington, MN

B. Larsens Manufacturing Co., Minneapolis, MN

C. Modern Metal Products, Owatonna, MN

D. Potter Roemer, Union, NJ

2.2 UNITS

A. Fire Extinguishers

1. Multipurpose Dry Chemical Type (For Class A,B,C Fires)
 - a. Utilizing fluidized and siliconized mono ammonium phosphate powder.
 - b. UL Rating: 20A-120BC
 - c. Nominal Capacity: 20 lbs.
2. Carbon Dioxide Type (For Class BC Fires)
 - a. Utilizing liquid carbon dioxide.
 - b. UL Rating: 10BC
 - c. Nominal Capacity: 10 lbs

B. Cabinets (Non-Fire-Rated Walls)

1. **ADA compliant cabinet/accessories –Recessed or Surface Mount as shown on plans. All exposed finishes to have clear anodized aluminum finish. Surface mount shall have rolled edges.**
2. Door Style: V (Vertical Glass Panel)
3. Door Glazing: 13 (Clear Wire Glass)
4. Finish (Aluminum): #180 clear anodized and door.
5. Cabinet Tub: Steel, with Electrostatic white epoxy finish primer, except at surface mounted application, clear anodized aluminum.
6. Brackets: As required for application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where cabinets will be installed.

B. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged units.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install, at locations indicated on Drawings and in accordance with manufacturer's recommendations. Securely fasten mounting brackets and cabinets to structure, square and plumb.

3.3 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection specialties are installed, unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet manufacturer.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 10670
STORAGE SHELVING

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 storage shelving as indicated on the drawings and/or specified herein.

1.3 QUALITY ASSURANCE

- A. Products shall be standard best quality for the particular kind of material required.

1.4 SUBMITTALS

A. Product Data

- 1. Manufacturer's catalogue and specifications.
- 2. Recommended installation procedures.

B. Shop Drawings

- 1. Elevations and sections.
- 2. Method of anchoring and connecting to surrounding construction.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver storage shelving in ample time to facilitate the work of this Section.
- B. Take care to protect components during handling and storage.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Storage shelving shall be closed type, 7 shelf units, 12" deep, width called for on the Drawings, of manufacturer's stock color.
 - 1. Shelves: 18 gauge steel with 1" x 1" x 1/8" reinforcing angles in front and rear flanges.
 - 2. Box post: Roll formed to a tubular box section, slotted on 1" centers at section front and punched at 3" centers on internal flange.
 - 3. End panels: 24 gauge steel sheet with side mounting holes punched to mate with 3" center holes on box post.

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4. Back panels: 24 gauge steel sheet with holes punched on centerline on 2" centers for attachment to shelves, and holes punched at edges to mate with 1" centered holes in box post.

2.2 MANUFACTURER

- A. Units shall be one of the following or other approved equal:
 1. Penco Products, Inc.: "Clipper", Class "2-A".
 2. Lundia Storage Systems: "Metalundia", heavy duty.
 3. Lyon Metal Products: Catalog No. 8263.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where storage shelving 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. Manufacturers' installation procedures shall govern.
- B. Install storage shelves square, level and true anchoring firmly to walls.
- C. Install required accessories as recommended by the manufacturer.

3.3 ADJUST AND CLEAN

- A. Clean and leave free from blemishes, defects and dirt. Use only cleaning agents recommended by the manufacturer.

END OF SECTION

SECTION 10800
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 provided by the City of New York and installed by the contractor.
 - 3. Grab bars.
 - 4. Toilet tissue dispenser provided by the City of New York and installed by the contractor..

1.3 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. Height of accessories shall be installed in compliance with prevailing Handicap Code.
- C. Products: Unless otherwise noted, provide products of same manufacturer for each type of unit and for units exposed in same areas.

1.4 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.

1.5 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.

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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:** Leaded and unleaded, flat products, FS QQ-B-613; Rods, shapes, forgings, and flat products with finished edges, FS QQ-B-626.
- C. **Galvanized Steel Sheet:** ASTM A527, G60.
- D. **Chromium Plating:** Nickel and chromium electro-deposited on base metal, ASTM B456, Type SC 2.
- E. **Mirror Glass:** FS DD-G-451, Type I, Class 1, Quality q1, 1/4" thick, with silver coating, copper protective coating, and non-metallic paint coating complying with FS DD-M-411.
 - 1. **Mirror Fasteners:**
 - a. **Bottom Support:** Continuous stainless steel unequal leg channel.
 - b. **Top Support:** Stainless steel or chrome plated clips, with fasteners not exposed to view.

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 A386) 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. Contractor shall take inventory of items to be provided by the City of New York, co-ordinate placement with the City of New York and furnish blocking at all accessories locations.**

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 Bobrick. Other manufacturer's as listed herein may substitute their products with the approval of the COMMISSIONER.
- B. Accessories – provide mounting kits, anchors, blocking and fasteners for installation requirements.
 - 1. Mirrors – B-165-1830 (at each lavatory).
 - 2. Soap dispensers – Provided by others, installed by Contractor (at each lavatory).
 - 3. Paper Towel dispenser - Provided by others, installed by Contractor .
 - 4. Grab bars –B-6808 – Lengths as indicated on drawings.
 - 5. Toilet tissue dispenser – Provided by others, installed by Contractor (at each w/c).

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 COMMISSIONER. 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 plum, level and secure manner.

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- 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 COMMISSIONER.
- 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 COMMISSIONER.
- F. The COMMISSIONER 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 COMMISSIONER 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 F446.

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 COMMISSIONER's satisfaction, at no additional cost.

END OF SECTION

SECTION 11450
APPLIANCES AND EQUIPMENT

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 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.

1.4 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. *Coordinate appliances with related work.*
- B. Refrigerator (Not in Contract – to be provided by the City of New York)
 - 1. WHIRLPOOL WRB329DMB or alternative manufacturer equal.
- C. Microwave (Not in Contract – to be provided by the City of New York)
 - 1. WHIRLPOOL WMC50522AS or alternative manufacturer equal.

2.2 VIDEO WALL

- A. Provide products manufactured by LG, NEC, SAMSUNG or approved equal. The following names and model numbers are those of LG; other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:
- B. LG 47LV35A-5B 47" class Video Wall Commercial Display system. Provide (4), wall hung, Daisy Chain linked video monitors in 4 x 1 configuration, stand alone digital signage player and necessary power, hardware, software and data connections for a fully installed and functioning video wall system.
- C. PC operated standalone with browser (signage box access from laptop or workstation using LAN cable) signage applications; layout creator, multi zone ready, create playlist, scheduler function, update or dispatch content, and supports playback in landscape or portrait mode.
- D. Wall mount as recommended for video wall display.

2.3 WALL MOUNTED VIDEO MONITORS

- A. Provide products manufactured by LG, NEC, SAMSUNG or approved equal. The following names and model numbers are those of SAMSUNG; other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated:
- B. (3) 48" LED Model with VGA input (for connection to patron queue computer) and as required for split screen connection to security camera system.
- C. Wall mount as recommended for video wall display.

PART 3 EXECUTION

3.1 APPLIANCE 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 APPLIANCE 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 COMMISSIONER, 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.
- F. General: Contractor shall purchase all equipment and directly provide installation or supervise installations/connections work furnished by other contractors (HVAC, Plumbing, Electrical).

END OF SECTION

SECTION 12501
CHAIN AND CLUTCH OPERATED WINDOW SHADES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide all window shade Work for every window indicated on the Drawings and as specified herein to provide a complete installation.
- B. Where required, remove existing shades completely, including all accessory items.
- C. Mock-ups: Build mock-ups to demonstrate quality standards for fabrication, operation, aesthetic effects and installation.

1.2 SUBMITTALS

- A. Samples:
 - 1. Samples of shade fabric for selection
 - 2. Samples for Verification:
 - a. Five pieces of shade cloth, 12" x 12" minimum
 - b. Complete, full-size operating unit not less than 16 inches (400 mm) wide for each type of roller shade indicated.
 - 3. Two rollers
 - 4. Two brackets of each type.
 - 5. Two 12" lengths of chain.
 - 6. Complete, full-size operating unit not less than 16 inches wide for each type of roller shade indicated.
- B. Product Data:
 - 1. Shade Cloth Data:

Submit data for shade cloth proposed, detailing characteristics and requirements as indicated in Art. 2.03.
- C. Shop Drawings: Schedule in accordance with Article 1.05 and installation details.
- D. Guarantees per Article 1.08.
 - 1. Contractor's one year guarantee on the total Work of this section.
 - 2. Contractor's 1 year guarantee on the shade cloth.
 - 3. Manufacturer's 5 year guarantee on the clutch mechanism.

1.3 QUALITY ASSURANCE:

- A. Manufacturer: Minimum of three years successful experience in the manufacture of products of type specified.

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- B. **Installer:** Minimum of three years successful experience in the removal, repair and installation of products of type specified.
- C. **Source Limitations:** Obtain roller shades through one source from a single manufacturer.
- D. **Mockups:** Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. **Approved mockups** may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 **DELIVERY, STORAGE, AND HANDLING**

- A. **Deliver shades in factory packages**, marked with manufacturer and product name, and location of installation using same designations indicated on Drawings and in a window treatment schedule. Store, and handle the products of this Section as recommended by the Manufacturers, to protect products.

1.5 **SCHEDULE OF SHADE EQUIPMENT**

- A. **The "Schedule of Shade Equipment"** shall indicate the rooms, window numbers, quantity of shades, types of equipment at each location.
 - 1. **Measurements:** The sizes stated in the "Schedule of Windows" represents the approximate sizes of window only to be installed. The Contractor shall take accurate measurements at the locations, promptly after the Award of Contract, and will be held strictly responsible for providing shades of the correct sizes.
 - 2. **Numbering of Windows:** Window numbers as stated in the "Schedule of Shade Equipment" shall begin with the window to the left of the room entrance when entering the room, and continue in a clockwise direction.

1.6 **PROJECT CONDITIONS**

- A. **Environmental Limitations:** Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for the Project when occupied for its intended use.
- B. **Field Measurements:** Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units operation hardware throughout the entire operating range. Notify COMMISSIONER of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 **PROJECT CLOSEOUT**

- A. **Shade Survey (Submit at the completion of the Work):**

The Contractor shall provide, for reference by the user, a chart summarizing the "Schedule of Shade Equipment" (see Art. 1.05). The information shall be site specific and shall include: Room Number, Window Number, actual shade size installed and type of shade installed at each window location.

Three copies of the summary chart shall be typewritten on 8 ½" by 11" sheets, bound and sheathed in a plastic binder or folder for submission.

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- B. Extra Materials: Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Rollers Shades: Before installation begins, for each size, color, texture, and pattern provide 4 units.
- C. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining roller shades and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
 - 3. Operating hardware.

1.8 GUARANTEE

- A. In addition to the Contractor's one-year guarantee on the total Work of this Section, the Contractor shall further provide a one-year manufacturer warranty that the shade cloth will continue to test approximately to the same structural and physical requirements as herein specified; if, during this one-year period, the shade cloth shows any appreciable deterioration, the Contractor shall replace the shade cloth at no expense to the City of New York.
- B. The shade manufacturer shall provide a 5 years warrantee against defects in materials and workmanship for clutch operating mechanism.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Shade Systems:
 - 1. Draper, 411 South Pearl Steet, Spiceland, Indiana
 - 2. Mecho Shade Systems, 42-03 35th Street, L.I.C., N.Y.
 - 3. Hunter Douglas, Poway, CA 92064

2.2 MANUALLY OPERATED WINDOW SHADES

- A. Type: Manually operated, vertical roll-up, fabric window shade with bead chain and clutch operating mechanism, mounting brackets, fasteners, and other components necessary for complete installation;
- B. Operation: Bead chain and clutch operating mechanism allowing shade to stop when chain is released. Designed never to need adjustment or lubrication. Provide preset limit stops to prevent shade from being raised or lowered too far.
 - 1. Clutch mechanism: Fabricated from high carbon steel and molded fiberglass reinforced polyester or injected molded nylon.
 - 2. Control loop: Stainless steel bead chain hanging at side of window.
 - 3. Chain location: Right hand side when facing window from interior.

2.3 MATERIALS

A. SHADE CLOTH

1. The shade cloth shall be a close woven fiberglass fabric, double coated vinyl plastic and shall have a high degree of opacity for the effective control of light. The shade cloth shall be pliable and properly treated to resist pinholing, cracking and breaking when rolled or folded, and in use.
2. The shade cloth shall be flame-resistant, waterproof, washable and color-fast to water and sunlight; with sufficient rigidity to ensure straight hanging without curling, twisting or being distorted. Shade cloth shall be commercially known as FIRST ONLY; no seconds of any nature shall be used or will be acceptable.

- B. Requirements of shade cloth shall be equal to Mechoshade Thermoveil dense basketweave I300 series, color: silver birch

Width: As scheduled or as required.

Opacity: 5% light transmission.

Washability: The shade cloth shall be able to withstand a test of ten washings on each side, first being soiled with dirt and then scrubbed by brush with hot water and soap.

- C. Roller: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Provide roller idler assembly of molded nylon and zinc-plated steel pin. Sliding pin to allow easy installation and removal of roller.

- D. Endcaps: Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size and fasteners appropriate for installation conditions. Finish to be white powder coat.

- B. Fascia: Provide manufacturer furnished fascia with design suitable for mounting to system brackets. Provide size compatible with roller size and fasteners appropriate for installation conditions. Provide continuous, unseamed fascia for each shade length length Finish to be white powder coat.

C. Slats:

1. Minimum 1/8 by 1 inch (3 mm by 25 mm) aluminum slat encased in seamed hem. No joints or splicing will be permitted in the shade slat.

D. Brackets:

1. Brackets for rollers: Zinc plated stamped steel suitable for mounting to soffits or ceiling. Provide size compatible with roller size and with fasteners appropriate for installation conditions. No fewer than two fasteners per bracket,

2.4 FABRICATION

- A. Cut the shade cloth in a sufficient length to allow the shade cloth to wrap twice around the roller, provide for a shade slat pocket, and of a sufficient length to pull down to the sill of the window. Form the slat pockets by folding the cloth so that the fold is on the room side of the

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shades, thereby providing a smooth surface on the window side. Stitching: straight stitch, with no less than 8 to 10 stitches to the inch, by means of a #33 (Dia.-.008) clear nylon monofilament or stranded thread. Reinforce the beginning and end of each stitch a minimum of two times.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Equip all windows, if height does not exceed 90", or unless otherwise specified, with single shades.
- B. All hardware shall be securely fastened to the existing construction. The number and type of fasteners shall be as required to prevent hardware from loosening, pulling out or becoming disengaged.

3.2 REPLACEMENT OF EXISTING WINDOW SHADES

- A. Complete removal and replacement:
 - 1. Remove old shades completely, including the cloth, roller, cord, slat-pulleys and check-pulley. Remove horizontal light strip, if required.
 - 2. Provide new window shade, complete with new cloth, roller, shade slat, chain and brackets.

3.3 DAMAGE

- A. If damage to adjacent areas occurs due to the Work of this Section, such damage shall be corrected by the Contractor at no cost to the City of New York.

3.4 CLEANING

- A. Clean all components of the window shade Work upon completion; remove all debris from the premises.

END OF SECTION

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SECTION 12690
FLOOR MATS 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 floor mats and frames as shown on the drawings and/or specified herein.

1.3 QUALITY ASSURANCE

- A. **Manufacturer:** Except as otherwise indicated, provide entrance mats and accessories by a single manufacturer for entire project.

1.4 SUBMITTALS

- A. **Product Data:** Submit manufacture's specifications and installation instructions or entrance mat. Include methods of installation for each type of substrate.
- B. **Samples:** Submit samples for each type and color of exposed entrance mat, frames and accessories required. Provide 12" square samples of mat materials and 12" lengths of frame members.
- C. **Maintenance Data:** Submit manufacturer's printed instructions for cleaning, drying, maintaining and rehandling of removable entrance mat units.

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 MANUFACTURER

- A. Provide products manufactured by Pawling, American Mat and Rubber Co (AMARCO), J.L. Industries or approved equal. The following names and model numbers are those of Pawling; other manufacturers noted subject to meeting drawing details and performance criteria specified herein and related to the specific products indicated or approved equal:
- B. Provide recessed entrance mat "Drainwell RGA-200" + "RGF-200" frame of sizes shown on drawings made by Pawling Corporation.

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2.2 MATERIALS

- A. Aluminum Metal: Alloy 6063-T6 and 6105-T5 conforming to ASTM B221.

2.3 COMPONENTS

- A. Grid: Aluminum, extruded profile, mill finish, with supports spaced 12 inches on center for maximum deflection of 0.080 inch with 1,000 pound uniform load, assembled with aircraft industry fasteners; snap-fit assembly not permitted.
- B. Resilient Pads: Vinyl, 1.3 inch wide, continuous, attached to supports on underside of rail to reduce movement and noise.
- C. Tread Insert: Aluminum abrasive infill; color as selected by COMMISSIONER from manufacturer's standards.
- D. Grating Frame: Manufacturer's standard deep pit frame mill finish, extruded aluminum profile, RGA-200 with 16 ga. aluminum pan and extruded aluminum I-beam support system, mill finish.
- E. All surfaces in contact with concrete shall have a shop coat of zinc chromate.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where floor mats 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 frames integrally with principal pour of concrete floor system. Locate, align and level frame members accurately.
- B. Protection: Upon completion of frame installations and concrete work, provide temporary filler of plywood or fiberboard in mat recesses, and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and project reaches substantial completion.
- C. Delay installation of mats until work on the project reaches substantial completion.
- D. Set mats in frames to fit tightly.

END OF SECTION

SECTION 15010

GENERAL PROVISIONS FOR MECHANICAL, PLUMBING AND FIRE PROTECTION WORK

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the Contract Documents, including the General and Supplementary General Conditions, shall apply to the work of this section.
- B. In case of conflict between these General Provisions and other existing or to be issued General or Supplementary General Conditions the more restrictive requirements govern as determined by the Commissioner.
- C. Drawings are diagrammatic and are a graphic representation of contract requirements to the best available standards at the scale required.
- D. System riser diagrams and schematic diagrams generally indicate equipment connections to be used for various systems. Provide all work shown on diagrams whether or not it is duplicated on the plans.
- E. Specifications include incomplete sentences. Words or phrases such as "the contractor shall," "shall be," "furnish," "provide," "a," "an," "the," and "all" are omitted for brevity.
- F. Except where modified by a specific notation to the contrary, the indication and/or description of any item, in the drawings, specifications or both, carries with it the instruction to furnish and install the item complete with all appurtenances or accessories necessary to complete any required system, regardless of whether or not this instruction is explicitly stated as part of the indication or description.
- G. Specifications and Drawings are complimentary and are to be taken together for a complete interpretation of the work.
- H. Drawings of necessity utilize symbols and schematic diagrams to indicate various items of work. Neither of these have any dimensional significance nor do they delineate every item required for the intended installation. Install the work in accordance with the diagrammatic intent expressed on the drawings, and in conformity with the dimensions indicated on final architectural and structural working drawings and on equipment shop drawings.
- I. Certain details appear on the drawings which are specific with regard to the dimensioning and positioning of the work. These details are intended only for the purpose of establishing general feasibility. They do not obviate field coordination for the indicated work.
- J. Derive information as to the general construction from structural and architectural drawings and specifications.
- K. Examine all drawings. Coordinate the work of this section with all related and adjoining work.
- L. No exclusions from, or limitations, in the language used in the drawings or specifications are to be interpreted as meaning that the appurtenances or accessories necessary to complete any required system or item of equipment are to be omitted.
- M. Do not consider the use of words in the singular to be limiting where other indications denote that more than one item is referred to.
- N. Make no interpretation from the limitation of symbols and diagrams that any elements necessary for complete work are excluded.

1.02 QUALITY ASSURANCE AND STANDARDS

- A. Make the complete installation in accordance with all New York City and Local Municipal Codes, all applicable codes and authorities having jurisdiction, and the applicable requirements and standards of the following:

| | | |
|--------|---|---|
| AIA | - | American Insurance Association |
| AGA | - | American Gas Association |
| IEEE | - | Institute of Electrical and Electronics Engineers |
| ANSI | - | American National Standards Institute |
| ASHRAE | - | American Society of Heating, Refrigerating and Air Conditioning Engineers |
| ASME | - | American Society of Mechanical Engineers |
| ASSE | - | American Society of Sanitary Engineers |
| ASTM | - | American Society for Testing and Materials |
| AWS | - | American Welding Society |
| AWWA | - | American Water Works Association |
| IBR | - | Institute of Boiler and Radiator Manufacturers |
| AMCA | - | Air Moving and Conditioning Association |
| MSS | - | Manufacturer's Standardization Society of the Valve and Fitting Industry |
| NEC | - | National Electrical Code |
| NEMA | - | National Electrical Manufacturers Association |
| PDI | - | Plumbing and Drainage Institute |
| SBI | - | Steel Boiler Institute |
| UL | - | Underwriters Laboratories |
| SMACNA | - | Sheet Metal and Air Conditioning Contractors National Association |
| NFPA | - | National Fire Protection Association |

- B. Refer to the Commissioner for decisions on any items or requirements noted in the specifications or drawings which conflict with the standards listed above. Provide all work necessary to comply with these requirements by the Contractor at no extra cost to the City of New York.

1.03 ACCEPTANCE OF THE WORK

- A. Make all workmanship, equipment and materials supplied under this contract acceptable to the City of New York and the Commissioner who have the power to reject any item which in their judgment are not in full accordance with the plans and specifications.

1.04 PERMITS, CERTIFICATES AND FEES

- A. Obtain and deliver a final Certificate of Approval from the applicable inspection authority having jurisdiction. Make delivery to the Commissioner for transmittal to the City of New York upon completion of the work and before final payment. Pay all charges made by the inspection authority and include their cost in the bid.
- B. Include the procurement of and payment for all permits, certificates and fees for the performance of the plumbing work in compliance with codes, applicable laws and municipal regulations including those from local utilities for services.

1.05 SCOPE OF WORK

- A. The Specifications and the accompanying drawings are intended to secure the provisions of all material, labor, equipment, and services necessary to install a complete, tested, and ready for operation Mechanical, Plumbing and Fire Protection Systems. Provide all systems complete with necessary appurtenances and minor auxiliaries, including offsets to clear interferences and supports

which are not shown but are needed to make each system complete in every respect. Provide all work described in the Specifications and not shown on the Drawings, or vice versa, in complete working order. If mention has been omitted of any item of work or material, necessary for completion of the system, then such items must be and are hereby included.

1.06 EXAMINATION OF EXISTING CONDITIONS

- A. Before submitting a proposal, the Contractor is responsible for visiting the site of the work and becoming thoroughly familiar with all conditions and limitations. The submission of a proposal will be construed as evidence that such an examination has been made, and later claims for labor, equipment or materials required for difficulties encountered which could have been foreseen had such an examination been made will not be recognized.
- B. Verify all grades, elevations, dimensions, and clearances at the site.
- C. Examine all work prepared by others to receive the work of this Section and report any defects affecting installation to the Construction Manager for correction. Commencement of work will be construed as complete acceptance of preparatory work by others.
- D. Existing conditions or sizes are shown for reference only. Verify existing conditions and bring any discrepancies to Commissioner's attention in writing prior to submission.
- E. Invert elevations and service routing paths indicated on the drawings are based on information available during the design phase. During the construction phase, verify utility information including that indicated on surveys. Confirm a coordinated clear path in all dimensions from the building wall to the service connection points prior to setting inverts.

1.07 SHOP DRAWINGS AND OTHER INFORMATION REQUIRED

- A. Prior to purchasing equipment or materials, submit a list of proposed manufacturers.
- B. Shop drawings which are submitted out of sequence or without supplemental information necessary for proper evaluation of the submission are subject to delays in processing.
- C. Shop drawings must bear the Construction Manager's stamp certifying:
 - 1. That he has checked the submitted subcontractor's shop drawings.
 - 2. That the submitted shop drawing is fully coordinated with all interfacing trades and with other trades where interference may occur.
- D. Prior to assembling or installing the work, submit the following for review:
 - 1. Catalog information and factory assembly drawings, as required for a complete explanation and description of all items of equipment.
 - 2. Field installation drawings, as required to explain fully all procedures involved in erecting, mounting and connecting all items of equipment.
 - 3. Scale drawings indicating insert and sleeve locations.
- E. Materials installed or work performed without acceptance of materials is done at the risk of the Contractor, and the cost of removal of such material or work which is judged unsatisfactory for any reason is at the expense of the Contractor.
- F. Documents will not be accepted for review unless:
 - 1. Number of copies and type of paper complies with the requirements of the general conditions.

2. Complete information pertaining to appurtenances and accessories is included.
3. Submitted as a package where documents pertain to related items.
4. Properly marked with service or function identification as related to the project, where they consist of catalog sheets displaying other items which are not applicable.
5. Properly marked with external connection identification as related to the project where they consist of standard factory assembly or field installation drawings.

1.08 PROTECTION, MAINTENANCE, PRODUCT HANDLING AND CLEANING

- A. Deliver and store Mechanical, Plumbing and Fire Protection equipment at the site, properly packed and crated until finally installed. Store materials in spaces as designated by the General Contractor. Investigate each space through which equipment must be moved. If necessary, have equipment shipped from manufacturer in crated sections of size suitable for moving through restricted spaces.
- B. Adequately protect uninstalled and installed equipment and materials against loss or stealing, damage caused by water, paint, fire, plaster, moisture, acids, fumes, dust or other environmental conditions, or physical damage, during delivery, storage, installation and shutdown conditions. Replace any damaged or stolen material without extra cost to the City of New York.
- C. Provide effective protection for all material and equipment against damage that may be caused by environmental conditions. Do no work when conditions of temperature in area or moisture on materials or substrates are not in accordance with material manufacturer's recommended conditions for installation.
- D. Maintain all equipment and systems installed, until final acceptance by the Commissioner and the City of New York. The operation of the equipment by the City of New York does not constitute an acceptance of the work. Work will be accepted only after the Contractor has adjusted his equipment, demonstrated that it fulfills the requirements of the Drawings and Specifications, and has furnished all required certificates.
- E. Provide effective protection against damage for all materials and equipment during shipment, and storage at the Project Site. Cover all stored equipment to exclude dust and moisture. Place stored equipment on pallets or racks with appropriate weather cover.
- F. After duct work, piping and equipment are installed, cover openings to prevent entrance of water and foreign materials. Close openings with temporary metal or plastic caps.
- G. Protect all rough and finished floors and other finished surfaces from damage which may be caused by construction materials and methods. Protect floors with tarpaulins, chip pans and oil-proof floor covering. Protect finished surfaces from welding and cutting splatters with baffles and splatter blankets. Protect finished surfaces from paint droppings, adhesive and other marring agents with drop cloths. Protect other surfaces with appropriate protective measures.
- H. Deliver materials to Project Site in manufacturer's original unopened containers with manufacturer's name and product identification clearly marked thereon.
- I. Fill and flush out all water systems to remove dirt and metal particles.
- J. After flushing operation, run pumps for three days minimum with pump strainer in. Clean and replace all strainers. All flushing and cleaning of piping systems to be witnessed by the Development Manager and all results submitted for approval and acceptance.
- K. After completion of project, clean the exterior surface of equipment and fixtures included in this section, including concrete residue.

1.09 EQUIPMENT AND MATERIALS

- A. Provide equipment and materials required for installation under these specifications to be new and without blemish or defect. Equipment and materials to be products which will meet with the acceptance of authorities having jurisdiction over the work. Where such acceptance is contingent upon having the products listed or labeled by Underwriters Laboratories Inc., or other test laboratory, the products to be so listed or labeled. Where no specific indication as to the type or quality of material or equipment is indicated, furnish a first class standard article.
- B. It is the intent of these specifications that wherever a manufacturer of a product is specified, and the terms "other acceptable" or "equal" are used, the substituted item must conform in all respects to the specified item. Consideration will not be given to claims that the substituted item meets the performance requirements with lesser construction (such as lesser heat exchange surface, etc.). Performance as delineated in schedules and in the specifications to be interpreted as minimum performance. In many cases, equipment is oversized to allow for pick-up loads which cannot be delineated under the minimum performance.
- C. All equipment of one type where possible to be produced by one manufacturer.
- D. Substituted equipment or optional equipment where permitted and accepted must conform to space requirements. Any substituted equipment that cannot meet space requirements, whether accepted or not, must be replaced at the Contractor's expense. Any modifications of related systems as a result of substitutions must also be made at the Contractor's expense.
- E. Note that the review of shop drawings, or other information submitted in accordance with the requirements hereinbefore specified, do not assure that the Commissioner attests to the dimensional accuracy or dimensional suitability of the material or equipment involved. Review of shop drawings does not invalidate the plans and specifications if in conflict, unless a letter requesting such change is submitted and accepted on the Commissioner's letterhead.
- F. Substitutions of mechanical equipment for that shown on the schedules or designated by model number in the specifications will not be considered if the item is not a regular cataloged item shown in the current catalog of the manufacturer.

1.10 ACCESS DOORS IN FINISHED CONSTRUCTION

- A. Furnish access doors as required for operation and maintenance of concealed equipment, valves, controls, fire protection zone control stations, etc. Access doors will be installed under another division of the work. Coordinate their delivery with the installing Trade.
- B. Coordinate and prepare a location, size, and function schedule of access doors required and deliver to the Commissioner and the Installing Contractor.
- C. Doors to be minimum size required for operating and repacking valves or maintaining cleanouts, etc.
- D. Doors to be as manufactured by Karp Associates, Inland Steel products "Milcor" or other approved in accordance with the following schedule:

| Location | Type | Catalog Number |
|--------------------------------------|---------------------------------|------------------------------------|
| Plaster Ceiling
Panel for Plaster | Recessed Door | Karp DSC-210-PS
Milcor Style B |
| Acoustical Tile
Ceiling | Recessed Door
Panel for Tile | Karp DSC2-210-AT
Milcor Style A |
| Plaster Wall
Door Panel | Non-Recessed
Milcor Style A | Karp DSC-211 |

| | | |
|---|----------------------------|----------------------------------|
| Drywall | Non-Recessed
Door Panel | Karp DSC-214-M
Milcor Style M |
| Ceramic Tile
Walls | Non-Recessed
Door Panel | Karp DSC-214-M
Milcor Style M |
| Masonry Wall | Non-Recessed
Door Panel | Karp DSC-211
Milcor Style M |
| 3-hour Rated
Masonry Pipe or
Duct Shaft | Non-Recessed
Door Panel | Karp DSC-211-FRT |
| 1-1/2-Hour Rated
Pipe or Duct Shaft | Recessed
Door Panel | Karp 150-FR
Rated |

- E. Doors and frames to be given a factory prime coat of corrosion resistant paint.
- F. Frames to be welded, minimum 14 gauge steel, mitered corners ground smooth with anchors.
- G. Doors to be minimum 14 gauge steel, heavy hinged flush with frame, invisible when closed.

1.11 TOOLS

- A. Deliver all special tools for proper operation and maintenance of the equipment provided under this specification to the Commissioner and obtain a receipt as evidence of delivery.
- B. IDENTIFICATION
 - 1. Valves
 - 2. Valve identification to comply with MSSSP-25.
 - 3. Attach a 2" round brass tag stamped with designating numbers 1" high filled in with black enamel to each valve, except those on fixtures.
 - 4. Securely fasten valve tag to valve spindle or handle with a brass chain.
 - 5. Appropriate ceiling tile markers, in areas where removable ceilings occur to indicate location of valves or other devices, to be provided under the general construction division of these specifications.
- C. Motor Control Identification
 - 1. Mount black lamacoid nameplates on each motor controller identifying primary control function and individual position indication such as Pump No. 1, etc. Nameplates to be cut through to white background and have beveled edges. Mounted with chromium plated acorn head screws.
- D. Schedule and Charts
 - 1. Furnish to Commissioners three complete framed plastic laminated valve tag schedules. Schedule to indicate tag number, valve location by floor and nearest column number, valve size and service controlled.
- E. Piping Identification and Coding
 - 1. Apply color coded Polyvinyl Chloride pipe bands identifying pipe contents and direction of flow.

2. On exposed piping, apply bands on 30 foot centers of straight runs, at valve locations, at point where piping enters and leaves a partition, wall, floor or ceiling.
3. On concealed piping installed above removable ceiling construction, apply bands in manner described for exposed piping.
4. On concealed piping installed above non-removable ceiling construction, or in pipe shafts, apply bands at valve or other devices that are made accessible by means of access doors or panels.
5. Apply bands at exit and entrance points to each vessel, tank or piece of equipment.
6. Band widths to be 8 inch for pipes up to 10 inch diameter and 16 inch wide for larger diameter piping. Letter heights stating service to be preprinted on band, 3/4 inch high for 8 inch bands and 1-1/4 inch high for 16 inch bands.
7. For insulated pipes, apply bands after insulation and painting work has been completed.
8. Colors to conform to ASA Standard A13.1. Provide 24 additional bands of each type for future use by the City of New York's personnel.
9. Follow manufacturer's instructions for application procedures using non-combustible materials and contact adhesives.

1.12 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. After completion of all required equipment and system tests and unless specifically noted elsewhere in these specifications, provide at City of New York's/operator's convenience, knowledgeable personnel and necessary equipment to reasonably instruct and demonstrate the operation and maintenance of said equipment and system. Arrange for the related manufacturer or authorized representative to assist with this orientation.
- B. Before requesting acceptance of work, furnish 5 copies in bound form of a complete instruction manual, typewritten or printed.
- C. Include the following in the instruction manuals:
 1. Table of Contents
 2. Introduction - Explanation of manual and its use
 3. Description of system or equipment
 - a. Complete schematic drawings of all systems
 - b. Functional and sequential description of all systems.
 4. Systems operation
 - a. Operation procedures
 - b. All posted instruction charts
 5. Maintenance
 - a. Systems trouble-shooting charts
 - b. Procedures for checking out functions
 - c. Recommended list of spare parts

6. Listing of manufacturers
7. Manufacturer's data: Where multiple model, type and size listings are included, clearly and conspicuously indicate those that are pertinent to this installation.
 - a. Description - literature, drawings, illustrations, certified performance charts, technical data, etc.
 - b. Operation
 - c. Maintenance - including complete trouble-shooting charts
 - d. Parts list
 - e. Names, addresses and telephone numbers of recommended repair and service companies
 - f. Guarantee data

1.13 PAINTING

- A. Deliver all equipment with standard factory finish or as specified. Clean all equipment before acceptance by the City of New York.
- B. Except as otherwise specified, finish painting will be done under other Sections of the work.

1.14 SITE VISITS FOR OBSERVATION

- A. As the project progresses Commissioners, at their discretion, will perform site visits to observe the mechanical and electrical installations. At the conclusion of these site visits, punchlists will be issued to the appropriate Contractor for the deficiencies in the work of his trade. Complete all work and perform all corrective measures as required by the punchlists. After this corrective and completion work has been accomplished advise the Commissioner in writing that every item on the punchlists has been completed.

1.15 REMOVAL AND RELOCATION OF EXISTING WORK

- A. Visit the site and verify the existing conditions before submitting a proposal.
- B. Provide all materials, labor and supervision required to remove, relocate and alter the existing site plumbing work and fire hydrants systems as required or as indicated on the Plumbing, Fire Protection, and Architectural or General Construction Plans, so as to commence and complete the construction of this building.

1.16 GUARANTEES AND CERTIFICATIONS

- A. Guarantee all work to be free from leaks or defects. Replace or repair defective materials or workmanship as well as damage to the work of the trades resulting from same as directed for the duration of stipulated guarantee periods.
- B. Duration of guarantee periods following the date of acceptance of the work, unless otherwise specified, is one year.
- C. The date of acceptance is the date of the final payment for the work or the date of a formal notice of acceptance whichever is earlier.
- D. If received in writing, request to have earlier acceptance dates established for these items will be considered.
- E. Submit certification attesting to the fact that specified performance criteria are met by all items of the plumbing and fire protection systems.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

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SECTION 15050

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Transition fittings.
 - 3. Dielectric fittings.
 - 4. Mechanical sleeve seals.
 - 5. Sleeves.
 - 6. Escutcheons.
 - 7. Grout.
 - 8. Equipment installation requirements common to equipment sections.
 - 9. Painting and finishing.
 - 10. Concrete bases.
 - 11. Supports and anchorages.

1.03 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspace, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.04 SUBMITTALS

- A. Product Data: For the following:
 - 1. Transition fittings.
 - 2. Dielectric fittings.

- 3. Mechanical sleeve seals.
 - 4. Escutcheons.
 - B. Welding certificates.
- 1.05 QUALITY ASSURANCE
- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
 - B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
 - 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
 - C. Electrical Characteristics for Mechanical Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.
- 1.06 DELIVERY, STORAGE, AND HANDLING
- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.
 - B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.
- 1.07 COORDINATION
- A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for mechanical installations.
 - B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
 - C. Coordinate requirements for access panels and doors for mechanical items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 8 Section "Access Doors and Frames."

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.02 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 15 piping Sections for pipe, tube, and fitting materials and joining methods.

- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.03 JOINING MATERIALS

- A. Refer to individual Division 15 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
 2. AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- E. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAgl, silver alloy for refrigerant piping, unless otherwise indicated.
- G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.04 TRANSITION FITTINGS

- A. AWWA Transition Couplings: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.
1. Manufacturers:
 - a. Cascade Waterworks Mfg. Co.
 - b. Dresser Industries, Inc.; DMD Div.
 - c. Ford Meter Box Company, Incorporated (The); Pipe Products Div.
 - d. JCM Industries.
 - e. Smith-Blair, Inc.
 - f. Viking Johnson.
- B. Flexible Transition Couplings for Underground Nonpressure Drainage Piping: ASTM C 1173 with elastomeric sleeve, ends same size as piping to be joined, and corrosion-resistant metal band on each end.
1. Manufacturers:
 - a. Cascade Waterworks Mfg. Co.
 - b. Fernco, Inc.

- c. Mission Rubber Company.
- d. Plastic Oddities, Inc.

2.05 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Revise pressure ratings and temperatures in five paragraphs and associated subparagraphs below to suit Project or add other options for specific applications.
- D. Dielectric Unions: Factory-fabricated, union assembly, for 300-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).
 - 1. Manufacturers:
 - a. Capitol Manufacturing Co.
 - b. Central Plastics Company.
 - c. Eclipse, Inc.
 - d. Epco Sales, Inc.
 - e. Hart Industries, International, Inc.
 - f. Watts Industries, Inc.; Water Products Div.
 - g. Zurn Industries, Inc.; Wilkins Div.
- E. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 300-psig minimum working pressure as required to suit system pressures.
 - 1. Manufacturers:
 - a. Capitol Manufacturing Co.
 - b. Central Plastics Company.
 - c. Epco Sales, Inc.
 - d. Watts Industries, Inc.; Water Products Div.
- F. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
 - 1. Manufacturers:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Central Plastics Company.
 - d. Pipeline Seal and Insulator, Inc.
 - 2. Separate companion flanges and steel bolts and nuts shall have 300-psig minimum working pressure where required to suit system pressures.

G. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

1. Manufacturers:
 - a. Calpico, Inc.
 - b. Lochinvar Corp.
 - c. Or approved equal.

H. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

1. Manufacturers:
 - a. Perfection Corp.
 - b. Precision Plumbing Products, Inc.
 - c. Sioux Chief Manufacturing Co., Inc.
 - d. Victaulic Co. of America.

2.06 MECHANICAL SLEEVE SEALS

A. Units in this Article are usually furnished with EPDM sealing elements, plastic pressure plates, and carbon-steel bolts. NBR and silicone sealing elements, carbon- and stainless-steel pressure plates, and stainless-steel bolts are available for special applications.

B. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

1. Manufacturers:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Metraflex Co.
 - d. Pipeline Seal and Insulator, Inc.
2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.07 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

C. Sleeve in paragraph below is available with many end variations.

- D. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- E. Sleeve in paragraph below is without seepage holes and cannot be used instead of a floor drain.
- F. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
 - 1. Underdeck Clamp: Clamping ring with set screws.
- G. PVC sleeves in first two paragraphs below may be prohibited by fire authorities having jurisdiction.
- H. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.
- I. PVC Pipe: ASTM D 1785, Schedule 40.
- J. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

2.08 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
- B. Do not delete or combine types of escutcheons in seven paragraphs below until selections in Part 3 "Piping Systems - Common Requirements" Article are made.
- C. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- D. One-Piece, Cast-Brass Type: With set screw.
 - 1. Finish: Polished chrome-plated.
- E. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
 - 1. Finish: Polished chrome-plated.
- F. One-Piece, Stamped-Steel Type: With set screw and chrome-plated finish.
- G. Split-Plate, Stamped-Steel Type: With concealed hinge, set screw, and chrome-plated finish.
- H. One-Piece, Floor-Plate Type: Cast-iron floor plate.
- I. Split-Casting, Floor-Plate Type: Cast brass with concealed hinge and set screw.

2.09 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
 - 1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
 - 2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
 - 3. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.01 MECHANICAL DEMOLITION

- A. Refer to General Conditions for general demolition requirements and procedures.

- B. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - 3. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - 4. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
 - 5. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - 6. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - 7. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to the City of New York.
- C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.02 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 15 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping to permit valve servicing.
- G. Install piping at indicated slopes.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Install escutcheons for penetrations of walls, ceilings, and floors according to the following:
 - I. New Piping:

- a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass type with polished chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type with spring clips.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
 - e. Retain subparagraph above or first subparagraph below.
 - f. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
 - g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
 - h. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type with concealed hinge and set screw or spring clips.
 - i. Bare Piping in Equipment Rooms: One-piece, stamped-steel type with set screw or spring clips.
 - j. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece, floor-plate type.
2. Existing Piping: Use the following:
- a. Chrome-Plated Piping: Split-casting, cast-brass type with chrome-plated finish.
 - b. Insulated Piping: Split-plate, stamped-steel type with concealed or exposed-rivet hinge and spring clips.
 - c. Bare Piping at Wall and Floor Penetrations in Finished Spaces: Split-casting, cast-brass type with chrome-plated finish.
 - d. Bare Piping at Ceiling Penetrations in Finished Spaces: Split-casting, cast-brass type with chrome-plated finish.
 - e. Bare Piping in Unfinished Service Spaces: Split-casting, cast-brass type with polished chrome-plated finish.
 - f. Bare Piping in Equipment Rooms: Split-plate, stamped-steel type with set screw or spring clips.
 - g. Bare Piping at Floor Penetrations in Equipment Rooms: Split-casting, floor-plate type.
- M. Sleeves are not required for core-drilled holes.
- N. Permanent sleeves are not required for holes formed by removable PE sleeves.
- O. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.
- P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
- 1. Cut sleeves to length for mounting flush with both surfaces.

- a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches (50 mm) above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
 3. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
 - a. Edit pipe size range in first two subparagraphs below to suit Project. Confirm that PVC materials are allowed for sleeves by fire authorities having jurisdiction.
 - b. Steel Pipe Sleeves: For pipes smaller than NPS 6 (DN 150).
 - c. Steel Sheet Sleeves: For pipes NPS 6 (DN 150) and larger, penetrating gypsum-board partitions.
 - d. Stack Sleeve Fittings: For pipes penetrating floors with membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches (50 mm) above finished floor level. Refer to Division 7 Section "Sheet Metal Flashing and Trim" for flashing.
 - 1) Seal space outside of sleeve fittings with grout.
 4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 7 Section "Joint Sealants" for materials and installation.
- Q. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Install steel pipe for sleeves smaller than 6 inches in diameter.
 2. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
 3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- R. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- S. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 7 Section "Through-Penetration Firestop Systems" for materials.
- T. Verify final equipment locations for roughing-in.
- U. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.03 PIPING JOINT CONSTRUCTION

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Basic Mechanical Materials and Methods
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- A. Join pipe and fittings according to the following requirements and Division 15 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.04 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
 - 1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
 - 2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.
 - 3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
 - 4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.05 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

3.06 PAINTING

- A. Division 9 Sections specify paint products for various surfaces (e.g., ferrous and nonferrous metals and insulation jackets), mechanical items to be field painted, application methods, and coating systems (number of prime and finish coatings and coating thicknesses). Coordinate these requirements with Commissioner to ensure that appropriate painting requirements are retained in these Division 9 Sections.
- B. Painting of mechanical systems, equipment, and components is specified in Division 9 Section 09900 – Painting and Finishing
- C. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.07 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
 - 1. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit.
 - 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.
 - 3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
 - 4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 5. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.08 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to 05500 "Miscellaneous Metals" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
- C. Field Welding: Comply with AWS D1.1.

3.09 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor mechanical materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

3.10 GROUTING

- A. Mix and install grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.

- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

END OF SECTION 15050

SECTION 15060

HANGERS AND SUPPORTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following hangers and supports for mechanical system piping and equipment:

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Pipe stands.
7. Pipe positioning systems.
8. Equipment supports.

- B. Related Sections include the following:

1. Section 05500 "Miscellaneous Metals" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
2. Section 15245 "Vibration Isolation" for vibration isolation devices.
3. Section 15121 "Pipe Expansion Compensation" for pipe guides and anchors.
4. Section 15890 "Ductwork".

1.03 DEFINITIONS

- A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.
- B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.04 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from commissioner.

1.05 SUBMITTALS

- A. Product Data: For the following:
 - 1. Steel pipe hangers and supports.
 - 2. Thermal-hanger shield inserts.
 - 3. Powder-actuated fastener systems.
 - 4. Pipe positioning systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
 - 1. Trapeze pipe hangers. Include Product Data for components.
 - 2. Metal framing systems. Include Product Data for components.
 - 3. Pipe stands. Include Product Data for components.
 - 4. Equipment supports.
- C. Welding certificates.

1.06 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to the following:
 - 1. Retain applicable standards below.
 - 2. AWS D1.1, "Structural Welding Code--Steel."
 - 3. AWS D1.2, "Structural Welding Code--Aluminum."
 - 4. AWS D1.3, "Structural Welding Code--Sheet Steel."
 - 5. AWS D1.4, "Structural Welding Code--Reinforcing Steel."
 - 6. ASME Boiler and Pressure Vessel Code: Section IX.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 STEEL PIPE HANGERS AND SUPPORTS

- A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
- B. Manufacturers:
 - 1. AAA Technology & Specialties Co., Inc.
 - 2. Bergen-Power Pipe Supports.
 - 3. B-Line Systems, Inc.; a division of Cooper Industries.
 - 4. Carpenter & Paterson, Inc.

5. Empire Industries, Inc.
 6. ERJCO/Michigan Hanger Co.
 7. Globe Pipe Hanger Products, Inc.
 8. Grinnell Corp.
 9. GS Metals Corp.
 10. National Pipe Hanger Corporation.
 11. PHD Manufacturing, Inc.
 12. PHS Industries, Inc.
 13. Piping Technology & Products, Inc.
 14. Tolco Inc.
- C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.
- D. Nonmetallic Coatings: Plastic coating, jacket, or liner.
- E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.03 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.04 METAL FRAMING SYSTEMS

- A. Metal framing systems in this Article require calculation and detail of each unit.
- B. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

1. Manufacturers:

- a. B-Line Systems, Inc.; a division of Cooper Industries.
 - b. ERICO/Michigan Hanger Co.; ERISTRUT Div.
 - c. GS Metals Corp.
 - d. Power-Strut Div.; Tyco International, Ltd.
 - e. Thomas & Betts Corporation.
 - f. Tolco Inc.
 - g. Unistrut Corp.; Tyco International, Ltd.
- C. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.
- D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.05 Description: 100-psig- minimum, compressive-strength insulation insert encased in sheet metal shield.

- A. Manufacturers:

1. Carpenter & Paterson, Inc.
 2. ERICO/Michigan Hanger Co.
 3. PHS Industries, Inc.
 4. Pipe Shields, Inc.
 5. Rilco Manufacturing Company, Inc.
 6. Value Engineered Products, Inc.
- B. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with vapor barrier.
- C. Insulation-Insert Material for Hot Piping: ASTM C 552, Type II cellular glass.
- D. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- E. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- F. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.06 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
1. Manufacturers:
 - a. Hilti, Inc.
 - b. ITW Ramset/Red Head.
 - c. Masterset Fastening Systems, Inc.
 - d. MKT Fastening, LLC.
 - e. Powers Fasteners.
- B. Mechanical-Expansion Anchors: Insert-wedge-type stainless steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
1. Manufacturers:
 - a. B-Line Systems, Inc.; a division of Cooper Industries.
 - b. Empire Industries, Inc.
 - c. Hilti, Inc.
 - d. ITW Ramset/Red Head.
 - e. MKT Fastening, I.I.C.
 - f. Powers Fasteners.

2.07 PIPE STAND FABRICATION

- A. Pipe Stands, General: Shop or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Compact Pipe Stand: One-piece plastic unit with integral-rod-roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
 - 1. Manufacturers:
 - a. ERICO/Michigan Hanger Co.
 - b. MIRO Industries.
 - c. Portable Pipe Hangers.
- C. Low-Type, Single-Pipe Stand: One-piece plastic base unit with plastic roller, for roof installation without membrane penetration.
 - 1. Manufacturers:
 - a. MIRO Industries.
 - b. Grinell.
 - c. Mason
- D. High-Type, Single-Pipe Stand: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
 - 1. Manufacturers:
 - a. ERICO/Michigan Hanger Co.
 - b. MIRO Industries.
 - c. Portable Pipe Hangers.

2.08 PIPE POSITIONING SYSTEMS

- A. Description: IAPMO PS 42, system of metal brackets, clips, and straps for positioning piping in pipe spaces for plumbing fixtures for commercial applications.
- B. Manufacturers:
 - 1. C & S Mfg. Corp.
 - 2. HOLDRITE Corp.; Hubbard Enterprises.
 - 3. Samco Stamping, Inc.

2.09 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

2.10 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and non-metallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.

2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 -EXECUTION

3.01 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use padded hangers for piping that is subject to scratching.
- F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30 .
 - 2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F, NPS 4 to NPS 16 requiring up to 4 inches of insulation.
 - 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24 , requiring clamp flexibility and up to 4 inches of insulation.
 - 4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, NPS 1/2 to NPS 24 if little or no insulation is required.
 - 5. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4 to allow off-center closure for hanger installation before pipe erection.
 - 6. Adjustable Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated stationary pipes, NPS 3/4 to NPS 8 .
 - 7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8 .
 - 8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8
 - 9. Adjustable Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 2 .
 - 10. Split Pipe-Ring with or without Turnbuckle-Adjustment Hangers (MSS Type 11): For suspension of noninsulated stationary pipes, NPS 3/8 to NPS 8
 - 11. Extension Hinged or 2-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated stationary pipes, NPS 3/8 to NPS 3
 - 12. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30 .
 - 13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 - 14. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36 with steel pipe base stanchion support and cast-iron floor flange.

15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes, NPS 4 to NPS 36 , with steel pipe base stanchion support and cast-iron floor flange and with U-bolt to retain pipe.
 16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, NPS 2-1/2 to NPS 36 , if vertical adjustment is required, with steel pipe base stanchion support and cast-iron floor flange.
 17. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30, from 2 rods if longitudinal movement caused by expansion and contraction might occur.
 18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes, NPS 2-1/2 to NPS 20 from single rod if horizontal movement caused by expansion and contraction might occur.
 19. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
 20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes, NPS 2 to NPS 24 , if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
 21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes, NPS 2 to NPS 30 , if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.
- G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20, if longer ends are required for riser clamps.
- H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.

5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- J. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- K. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from hanger.

6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.
7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from trapeze support.
8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- L. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
- M. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
- N. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.
- O. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

3.02 HANGER AND SUPPORT INSTALLATION

- A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
 2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.
- C. Fiberglass Pipe Hanger Installation: Comply with applicable portions of MSS SP-69 and MSS SP-89. Install hangers and attachments as required to properly support piping from building structure.
- D. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.
- E. Fiberglass Strut System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled fiberglass struts.
- F. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- G. Fastener System Installation:

1. Verify suitability of fasteners in two subparagraphs below for use in lightweight concrete or concrete slabs less than 4 inches thick.
 2. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
- H. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- I. Pipe Stand Installation:
1. Pipe Stand Types except Curb-Mounting Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
 2. Curb-Mounting-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. Refer to Division 7 Section "Roof Accessories" for curbs.
- J. Pipe Positioning System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture. Refer to Division 15 Section "Plumbing Fixtures" for plumbing fixtures.
- K. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- L. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- M. Install hangers and supports to allow controlled thermal and seismic 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
- N. Install lateral bracing with pipe hangers and supports to prevent swaying.
- O. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- P. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- Q. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.
- R. Insulated Piping: Comply with the following:
1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits according to ASME B31.1 for power piping and ASME B31.9 for building services piping.

2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6 : 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14 : 24 inches long and 0.075 inch thick.
 - e. NPS 16 to NPS 24 : 24 inches long and 0.105 inch thick.
 - f. Pipes NPS 8 and Larger: Include wood inserts.
5. Insert Material: Length at least as long as protective shield.
- S. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.03 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make smooth bearing surface.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.04 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.05 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.06 PAINTING

- A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
- B. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- C. Touch Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 9 painting Sections. Section
- D. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

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SECTION 15110

VALVES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following general-duty valves:

1. Bronze angle valves.
2. Cast-iron angle valves.
3. Copper-alloy ball valves.
4. Ferrous-alloy ball valves.
5. Ferrous-alloy butterfly valves.
6. High-pressure butterfly valves.
7. Bronze check valves.
8. Gray-iron swing check valves.
9. Ferrous-alloy wafer check valves.
10. Spring-loaded, lift-disc check valves.
11. Bronze gate valves.
12. Cast-iron gate valves.
13. Bronze globe valves.
14. Cast-iron globe valves.
15. Cast-iron plug valves.
16. Resilient-seated, cast-iron, eccentric plug valves.
17. Chainwheel actuators.

- B. Related Sections include the following:

1. Division 15 Section "HVAC Instrumentation and Controls" for control valves and actuators.
2. Division 15 piping Sections for specialty valves applicable to those Sections only.

1.03 DEFINITIONS

- A. The following are standard abbreviations for valves:

1. CWP: Cold working pressure.
2. EPDM: Ethylene-propylene-diene terpolymer rubber.
3. NBR: Acrylonitrile-butadiene rubber.
4. PTFE: Polytetrafluoroethylene plastic.
5. SWP: Steam working pressure.
6. TFE: Tetrafluoroethylene plastic.

1.04 SUBMITTALS

- A. Product Data: For each type of valve indicated. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.

1.05 QUALITY ASSURANCE

- A. ASME Compliance: ASME B31.1 for power piping valves and ASME B31.9 for building services piping valves.
- B. Exceptions: Domestic hot- and cold-water, sanitary waste, and storm drainage piping valves unless referenced.
- C. ASME Compliance for Ferrous Valves: ASME B16.10 and ASME B16.34 for dimension and design criteria.
- D. NSF Compliance: NSF 61 for valve materials for potable-water service.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 1. Protect internal parts against rust and corrosion.
 2. Protect threads, flange faces, grooves, and weld ends.
 3. Set angle, gate, and globe valves closed to prevent rattling.
 4. Set ball and plug valves open to minimize exposure of functional surfaces.
 5. Set butterfly valves closed or slightly open.
 6. Block check valves in either closed or open position.
- B. Use the following precautions during storage:
 1. Maintain valve end protection.
 2. Store valves indoors and maintain at higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
 3. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.02 VALVES, GENERAL

- A. Refer to Part 3 "Valve Applications" Article for applications of valves.
- B. Bronze Valves: NPS 2 and smaller with threaded ends, unless otherwise indicated.
- C. Ferrous Valves: NPS 2-1/2 and larger with flanged ends, unless otherwise indicated.
- D. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- E. Valve Sizes: Same as upstream pipe, unless otherwise indicated.
- F. Valve Actuators:
1. Chainwheel: For attachment to valves, of size and mounting height, as indicated in the "Valve Installation" Article in Part 3.
 2. Gear Drive: For quarter-turn valves NPS 8 and larger.
 3. Handwheel: For valves other than quarter-turn types.
 4. Lever Handle: For quarter-turn valves NPS 6 and smaller, except plug valves.
 5. Wrench: For plug valves with square heads. Furnish Owner with 1 wrench for every 10 plug valves, for each size square plug head.
 6. Extended Valve Stems: On insulated valves.
- G. Valve Flanges: ASME B16.1 for cast-iron valves, ASME B16.5 for steel valves, and ASME B16.24 for bronze valves.
- H. Valve Grooved Ends: AWWA C606.
1. Threaded: With threads according to ASME B1.20.1.
- J. Valve Bypass and Drain Connections: MSS SP-45.

2.03 BRONZE ANGLE VALVES

- A. Available Manufacturers:
1. Manufacturers:
 - a. Type 1, Bronze Angle Valves with Metal Disc:
 - 1) Cincinnati Valve Co.
 - 2) Crane Co.; Crane Valve Group; Stockham Div.
 - 3) Hammond Valve.
 - 4) Milwaukee Valve Company.

- 5) NIBCO INC.
- 6) Red-White Valve Corp.
- b. Type 2, Bronze Angle Valves with Nonmetallic Disc:
 - 1) American Valve, Inc.
 - 2) Cincinnati Valve Co.
 - 3) Crane Co.; Crane Valve Group; Crane Valves.
 - 4) Crane Co.; Crane Valve Group; Jenkins Valves.
 - 5) Crane Co.; Crane Valve Group; Stockham Div.
 - 6) Grinnell Corporation.
 - 7) Hammond Valve.
 - 8) NIBCO INC.
 - 9) Powell, Wm. Co.
- c. Type 3, Bronze Angle Valves with Metal Disc and Renewable Seat:
 - 1) Cincinnati Valve Co.
 - 2) Crane Co.; Crane Valve Group; Crane Valves.
 - 3) Crane Co.; Crane Valve Group; Jenkins Valves.
 - 4) Crane Co.; Crane Valve Group; Stockham Div.
 - 5) Grinnell Corporation.
 - 6) Milwaukee Valve Company.
 - 7) NIBCO INC.
- d. Bronze Angle Valves, General: MSS SP-80, with ferrous-alloy handwheel.
- e. Type 1, Class 125, Bronze Angle Valves: Bronze body with bronze disc and union-ring bonnet.
- f. Type 1, Class 150, Bronze Angle Valves: Bronze body with bronze disc and union-ring bonnet.
- g. Type 1, Class 200, Bronze Angle Valves: Bronze body with bronze disc and union-ring bonnet.
- h. Type 2, Class 125, Bronze Angle Valves: Bronze body with PTFE or TFE disc and union-ring bonnet.
- i. Type 2, Class 150, Bronze Angle Valves: Bronze body with PTFE or TFE disc and union-ring bonnet.
- j. Type 2, Class 200, Bronze Angle Valves: Bronze body with PTFE or TFE disc and union-ring bonnet.
- k. Type 3, Class 125, Bronze Angle Valves: Bronze body with bronze disc and renewable seat. Include union-ring bonnet.

- l. Type 3, Class 150, Bronze Angle Valves: Bronze body with bronze disc and renewable seat. Include union-ring bonnet.
- m. Type 3, Class 200, Bronze Angle Valves: Bronze body with bronze disc and renewable seat. Include union-ring bonnet.

2.04 CAST-IRON ANGLE VALVES

A. Available Manufacturers:

1. Manufacturers:

a. Type II, Cast-Iron Angle Valves with Metal Seats:

- 1) Crane Co.; Crane Valve Group; Crane Valves.
- 2) Crane Co.; Crane Valve Group; Jenkins Valves.
- 3) Crane Co.; Crane Valve Group; Stockham Div.
- 4) NIBCO INC.

b. Cast-Iron Angle Valves, General: MSS SP-85, Type II.

c. Class 125, Cast-Iron Angle Valves: Bronze mounted with gray-iron body and bronze seats.

d. Class 250, Cast-Iron Angle Valves: Bronze mounted with gray-iron body and bronze seats.

2.05 COPPER-ALLOY BALL VALVES

A. Available Manufacturers:

1. Manufacturers:

a. One-Piece, Copper-Alloy Ball Valves:

- b. American Valve, Inc.
- c. Conbraco Industries, Inc.; Apollo Div.
- d. Crane Co.; Crane Valve Group; Jenkins Valves.
- e. Crane Co.; Crane Valve Group; Stockham Div.
- f. DynaQuip Controls.
- g. Grinnell Corporation.
- h. Jamesbury, Inc.
- i. Kitz Corporation of America.
- j. Legend Valve & Fitting, Inc.
- k. NIBCO INC.
- l. Watts Industries, Inc.; Water Products Div.

2. Two-Piece, Copper-Alloy Ball Valves:

- a. Conbraco Industries, Inc.; Apollo Div.

- b. Crane Co.; Crane Valve Group; Crane Valves.
 - c. Crane Co.; Crane Valve Group; Jenkins Valves.
 - d. Crane Co.; Crane Valve Group; Stockham Div.
 - e. DynaQuip Controls.
 - f. Flow-Tek, Inc.
 - g. Grinnell Corporation.
 - h. Hammond Valve.
 - i. Honeywell Braukmann.
 - j. Jamesbury, Inc.
 - k. Jomar International, LTD.
 - l. Kitz Corporation of America.
 - m. Legend Valve & Fitting, Inc.
 - n. Milwaukee Valve Company.
 - o. Nexus Valve Specialties.
 - p. NIBCO INC.
 - q. R & M Energy Systems (Borger, TX).
 - r. Red-White Valve Corp.
 - s. Richards Industries; Marwin Ball Valves.
 - t. Watts Industries, Inc.; Water Products Div.
3. Three-Piece, Copper-Alloy Ball Valves:
- a. Conbraco Industries, Inc.; Apollo Div.
 - b. DynaQuip Controls.
 - c. Grinnell Corporation.
 - d. Hammond Valve.
 - e. Jamesbury, Inc.
 - f. Kitz Corporation of America.
 - g. NIBCO INC.
 - h. PBM, Inc.
 - i. Red-White Valve Corp.
 - j. Worcester Controls.
4. Safety-Exhaust, Copper-Alloy Ball Valves:
- a. Conbraco Industries, Inc.; Apollo Div.

- b. DynaQuip Controls.
 - c. Grinnell Corporation.
 - d. Hammond Valve.
 - e. Jamesbury, Inc.
 - f. Milwaukee Valve Company.
 - g. NIBCO INC.
- 5. Copper-Alloy Ball Valves, General: MSS SP-110.
 - 6. One-Piece, Copper-Alloy Ball Valves: Brass or bronze body with chrome-plated bronze ball, PTFE or TFE seats, and 400-psig minimum, 600-psig CWP rating.
 - 7. Two-Piece, Copper-Alloy Ball Valves: Brass or bronze body with full or regular-port, chrome-plated bronze ball; PTFE or TFE seats; and 600-psig minimum CWP rating and blowout-proof stem.
 - 8. Three-Piece, Copper-Alloy Ball Valves: Brass or bronze, Forged-brass and Bronze body with full or regular -port, chrome-plated bronze ball; PTFE or TFE seats; and 600-psig minimum CWP rating and blowout-proof stem.
 - 9. Safety-Exhaust, Copper-Alloy Ball Valves: Two-piece bronze body with exhaust vent opening, chrome-plated ball with vent, blowout-proof stem, locking handle, and working pressure rating for compressed air of at least 125 psig of 400-psig CWP of 600-psig CWP.

2.06 FERROUS-ALLOY BALL VALVES

A. Available Manufacturers:

1. Manufacturers:

- a. American Valve, Inc.
- b. Conbraco Industries, Inc.; Apollo Div.
- c. Cooper Cameron Corp.; Cooper Cameron Valves Div.
- d. Crane Co.; Crane Valve Group; Stockham Div.
- e. Flow-Tek, Inc.
- f. Foster Valve Co.
- g. Hammond Valve.
- h. Jamesbury, Inc.
- i. Jomar International, LTD.
- j. Kitz Corporation of America.
- k. KTM Products, Inc.
- l. McCANNA, Incorporated.
- m. Milwaukee Valve Company.
- n. NIBCO INC.

- o. PBM, Inc.
 - p. Richards Industries; Marwin Ball Valves.
 - q. Worcester Controls.
2. Ferrous-Alloy Ball Valves, General: MSS SP-72, with flanged ends.
 3. Ferrous-Alloy Ball Valves: Class 150, full or regular port.
 4. Ferrous-Alloy Ball Valves: Class 300, full or regular port.

2.07 FERROUS-ALLOY BUTTERFLY VALVES

A. Available Manufacturers:

1. Manufacturers:

a. Flangeless, Ferrous-Alloy Butterfly Valves:

- 1) American Valve, Inc.
- 2) Bray International, Inc.
- 3) Cooper Cameron Corp.; Cooper Cameron Valves Div.
- 4) Crane Co.; Crane Valve Group; Center Line.
- 5) Crane Co.; Crane Valve Group; Stockham Div.
- 6) Dover Corp.; Dover Resources Company; Norriseal Div.
- 7) General Signal; DeZurik Unit.Grinnell Corporation.
- 8) Hammond Valve.
- 9) Kitz Corporation of America.
- 10) Legend Valve & Fitting, Inc.
- 11) Metraflex Co.
- 12) Milwaukee Valve Company.
- 13) Mueller Steam Specialty.
- 14) NIBCO INC.
- 15) Process Development & Control.
- 16) Red-White Valve Corp.
- 17) Techno Corp.
- 18) Tyco International, Ltd.; Tyco Valves & Controls.
- 19) Watts Industries, Inc.; Water Products Div.

b. Single-Flange, Ferrous-Alloy Butterfly Valves:

- 1) American Valve, Inc.
- 2) Bray International, Inc.

- 3) Cooper Cameron Corp.; Cooper Cameron Valves Div.
- 4) Crane Co.; Crane Valve Group; Center Line.
- 5) Crane Co.; Crane Valve Group; Jenkins Valves.
- 6) Crane Co.; Crane Valve Group; Stockham Div.
- 7) Dover Corp.; Dover Resources Company; Norriseal Div.
- 8) General Signal; DeZurik Unit.
- 9) Grinnell Corporation.
- 10) Hammond Valve.
- 11) Kitz Corporation of America.
- 12) Legend Valve & Fitting, Inc.
- 13) Metraflex Co.
- 14) Milwaukee Valve Company.
- 15) Mueller Steam Specialty.
- 16) NIBCO INC.
- 17) Process Development & Control.
- 18) Red-White Valve Corp.
- 19) Techno Corp.
- 20) Tyco International, Ltd.; Tyco Valves & Controls.
- 21) Watts Industries, Inc.; Water Products Div.

c. Flanged, Ferrous-Alloy Butterfly Valves:

- 1) Bray International, Inc.
- 2) Cooper Cameron Corp.; Cooper Cameron Valves
- 3) Div.Grinnell Corporation.
- 4) Mueller Steam Specialty.
- 5) Tyco International, Ltd.; Tyco Valves & Controls.
- 6) Grooved-End, Ductile-Iron Butterfly Valves:
- 7) Central Sprinkler Co.; Central Grooved Piping Products.
- 8) Grinnell Corporation.
- 9) Hammond Valve.
- 10) McWane, Inc.; Kennedy Valve Div.
- 11) Milwaukee Valve Company.
- 12) Mueller Steam Specialty.

13) NIBCO INC.

14) Victaulic Co. of America.

- d. Ferrous-Alloy Butterfly Valves, General: MSS SP-67, Type 1, for tight shutoff, with disc and lining suitable for potable water, unless otherwise indicated.
- e. Flangeless, 150-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Wafer type with one or two-piece stem.
- f. Flangeless, 175-psigCWP Rating, Ferrous -Alloy Butterfly Valves: Wafer type with one- or two-piece stem.
- g. Flangeless, 200-psig CWP Rating, Ferrous-Alloy Butterfly Valves: Wafer type with one or two piece stem.
- h. Flangeless, 250-psig CWP Rating, Ferrous-Alloy Butterfly Valves: Wafer type with one or two -piece stem.
- i. Flangeless, 300-psigCWP Rating, Ferrous -Alloy Butterfly Valves: Wafer type with one or two -piece stem.
- j. Single-Flange, 150-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Wafer-lug type with one or two piece stem.
- k. Single-Flange, 175-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Wafer-lug type with one or two-piece stem.
- l. Single-Flange, 200- CWP Rating, Ferrous-Alloy Butterfly Valves: Wafer-lug type with one- or two-piece stem.
- m. Single-Flange, 250-psig CWP Rating, Ferrous-Alloy Butterfly Valves: Wafer-lug type with one or two-piece stem.
- n. Single-Flange, 300-psig CWP Rating, Ferrous-Alloy Butterfly Valves: Wafer-lug type with one or two-piece stem.
- o. Flanged, 150-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Flanged-end type with one- or two-piece stem.
- p. Flanged, 175-psig CWP Rating, Ferrous-Alloy Butterfly Valves: Flanged-end type with one- or two-piece stem.
- q. Flanged, 200-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Flanged-end type with one- or two-piece stem.
- r. Flanged, 250-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Flanged-end type with one- or two-piece stem.
- s. Flanged, 300-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Flanged-end type with one- or two-piece stem.
- t. Grooved-End, 175-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Ductile-iron or steel body with grooved or shouldered ends.
- u. Grooved-End, 300-psigCWP Rating, Ferrous-Alloy Butterfly Valves: Ductile-iron or steel body with grooved or shouldered ends.

2. HIGH-PERFORMANCE BUTTERFLY VALVES

- a. Available Manufacturers:

- 1) Manufacturers:
 - a) Bray International, Inc.
 - b) Cooper Cameron Corp.; Cooper Cameron Valves Div.
 - c) Crane Co.; Crane Valve Group; Flowseal.
 - d) General Signal; DeZurik Unit.
 - e) Grinnell Corporation.
 - f) Jamesbury, Inc.
 - g) Pratt, Henry Company.
 - h) Process Development & Control.
 - i) Tyco International, Ltd.; Tyco Valves & Controls.
 - j) Xomox Corporation.
- 2) High-Pressure Butterfly Valves, General: MSS SP-68.
- 3) Flangeless, Class 150, High-Pressure Butterfly Valves: Wafer type.
- 4) Single-Flange, Class 150, High-Pressure Butterfly Valves: Wafer type.
- 5) Flangeless, Class 300, High-Pressure Butterfly Valves: Wafer-lug type.
- 6) Single-Flange, Class 300, High-Pressure Butterfly Valves: Wafer-lug type.

B. BRONZE CHECK VALVES

1. Available Manufacturers:

a. Manufacturers:

- 1) Type 1, Bronze, Horizontal Lift Check Valves with Metal Disc:
 - a) Cincinnati Valve Co.
 - b) Crane Co.; Crane Valve Group; Crane Valves.
 - c) Crane Co.; Crane Valve Group; Stockham Div.
 - d) Red-White Valve Corp.
 - e) Walworth Co.
- 2) Type 2, Bronze, Horizontal Lift Check Valves with Nonmetallic Disc:
 - a) Cincinnati Valve Co.
 - b) Crane Co.; Crane Valve Group; Crane Valves.
 - c) Crane Co.; Crane Valve Group; Jenkins Valves.
 - d) Crane Co.; Crane Valve Group; Stockham Div.
 - e) Walworth Co.

- f) Type 1, Bronze, Vertical Lift Check Valves with Metal Disc:
 - g) Cincinnati Valve Co.
 - h) Crane Co.; Crane Valve Group; Crane Valves.
 - i) Crane Co.; Crane Valve Group; Jenkins Valves.
 - j) Red-White Valve Corp.
- 3) Type 2, Bronze, Vertical Lift Check Valves with Nonmetallic Disc:
- a) Grinnell Corporation.
 - b) Kitz Corporation of America.
 - c) Milwaukee Valve Company.
- 4) Type 3, Bronze, Swing Check Valves with Metal Disc:
- a) American Valve, Inc.
 - b) Cincinnati Valve Co.
 - c) Crane Co.; Crane Valve Group; Crane Valves.
 - d) Crane Co.; Crane Valve Group; Jenkins Valves.
 - e) Crane Co.; Crane Valve Group; Stockham Div.
 - f) Grinnell Corporation.
 - g) Hammond Valve.
 - h) Kitz Corporation of America.
 - i) Legend Valve & Fitting, Inc.
 - j) Milwaukee Valve Company.
 - k) NIBCO INC.
 - l) Powell, Wm. Co.
 - m) Red-White Valve Corp.
 - n) Walworth Co.
 - o) Watts Industries, Inc.; Water Products Div.
- 5) Type 4, Bronze, Swing Check Valves with Nonmetallic Disc:
- a) Cincinnati Valve Co.
 - b) Crane Co.; Crane Valve Group; Crane Valves.
 - c) Crane Co.; Crane Valve Group; Jenkins Valves.
 - d) Crane Co.; Crane Valve Group; Stockham Div.
 - e) Grinnell Corporation.
 - f) Hammond Valve.

- g) McWane, Inc.; Kennedy Valve Div.
 - h) Milwaukee Valve Company.
 - i) NIBCO INC.
 - j) Red-White Valve Corp.
 - k) Walworth Co.
 - l) Watts Industries, Inc.; Water Products Div.
- 6) Bronze Check Valves, General: MSS SP-80.
 - 7) Type 1, Class 125, Bronze, Horizontal Lift Check Valves: Bronze body with bronze disc and seat.
 - 8) Type 1, Class 125, Bronze, Vertical Lift Check Valves: Bronze body with bronze disc and seat.
 - 9) Type 1, Class 150, Bronze, Horizontal Lift Check Valves: Bronze body with bronze disc and seat.
 - 10) Type 1, Class 150, Bronze, Vertical Lift Check Valves: Bronze body with bronze disc and seat.
 - 11) Type 1, Class 200, Bronze, Horizontal Lift Check Valves: Bronze body with bronze disc and seat.
 - 12) Type 1, Class 200, Bronze, Vertical Lift Check Valves: Bronze body with bronze disc and seat.
 - 13) Type 2, Class 125, Bronze, Horizontal Lift Check Valves: Bronze body with nonmetallic disc and bronze seat.
 - 14) Type 2, Class 125, Bronze, Vertical Lift Check Valves: Bronze body with nonmetallic disc and bronze seat.
 - 15) Type 2, Class 150, Bronze, Horizontal Lift Check Valves: Bronze body with nonmetallic disc and bronze seat.
 - 16) No manufacturers for valves in first three paragraphs below were located. Verify availability if required.
 - 17) Type 2, Class 150, Bronze, Vertical Lift Check Valves: Bronze body with nonmetallic disc and bronze seat.
 - 18) Type 2, Class 200, Bronze, Horizontal Lift Check Valves: Bronze body with nonmetallic disc and bronze seat.
 - 19) Type 2, Class 200, Bronze, Vertical Lift Check Valves: Bronze body with nonmetallic disc and bronze seat.
 - 20) Type 3, Class 125, Bronze, Swing Check Valves: Bronze body with bronze disc and seat.
 - 21) Type 3, Class 150, Bronze, Swing Check Valves: Bronze body with bronze disc and seat.
 - 22) Type 3, Class 200, Bronze, Swing Check Valves: Bronze body with bronze disc and seat.

- 23) Type 4, Class 125, Bronze, Swing Check Valves: Bronze body with nonmetallic disc and bronze seat.
- 24) Type 4, Class 150, Bronze, Swing Check Valves: Bronze body with nonmetallic disc and bronze seat.
- 25) Type 4, Class 200, Bronze, Swing Check Valves: Bronze body with nonmetallic disc and bronze seat.

C. GRAY-IRON SWING CHECK VALVES

1. Available Manufacturers:

a. Manufacturers:

- 1) Type I, Gray-Iron Swing Check Valves with Metal Seats:
 - a) Cincinnati Valve Co.
 - b) Crane Co.; Crane Valve Group; Crane Valves.
 - c) Crane Co.; Crane Valve Group; Jenkins Valves.
 - d) Crane Co.; Crane Valve Group; Stockham Div.
 - e) Flomatic Valves.
 - f) Grinnell Corporation.
 - g) Hammond Valve.
 - h) Kitz Corporation of America.
 - i) Legend Valve & Fitting, Inc.
 - j) Milwaukee Valve Company.
 - k) Mueller Co.
 - l) NIBCO INC.
 - m) Powell, Wm. Co.
 - n) Red-White Valve Corp.
 - o) Walworth Co.
 - p) Watts Industries, Inc.; Water Products Div.
- 2) Type II, Gray-Iron Swing Check Valves with Composition to Metal Seats:
 - a) Crane Co.; Crane Valve Group; Crane Valves.
 - b) Crane Co.; Crane Valve Group; Stockham Div.
 - c) Mueller Co.
 - d) Watts Industries, Inc.; Water Products Div.
- 3) Grooved-End, Ductile-Iron Swing Check Valves:
 - a) Grinnell Corporation.

- b) Mueller Co.
- c) Victaulic Co. of America.
- 4) Gray-Iron Swing Check Valves, General: MSS SP-71.
- 5) Type I, Class 125, gray-iron, swing check valves with metal seats.
- 6) Type I, Class 250, gray-iron, swing check valves with metal seats.
- 7) Type II, Class 125, gray-iron, swing check valves with composition to metal seats.
- 8) Type II, Class 250, gray-iron, swing check valves with composition to metal seats.
- 9) 175-psigCWP Rating, Grooved-End, Swing Check Valves: Ductile-iron body with grooved or shouldered ends.
- 10) 300-psigCWP Rating, Grooved-End, Swing Check Valves: Ductile-iron body with grooved or shouldered ends.

D. FERROUS-ALLOY WAFER CHECK VALVES

1. Available Manufacturers:

a. Manufacturers:

1) Single-Plate, Ferrous-Alloy, Wafer Check Valves:

- a) Gestra, Inc.
- b) McWane, Inc.; Kennedy Valve Div.
- c) Mueller Co.
- d) Techno Corp.
- e) Tyco International, Ltd.; Tyco Valves & Controls.
- f) Wheatley Gaso, Inc.

2) Dual-Plate, Ferrous-Alloy, Wafer Check Valves:

- a) Crane Co.; Crane Valve Group; Crane Valves.
- b) Crane Co.; Crane Valve Group; Stockham Div.
- c) Flomatic Valves.
- d) Gestra, Inc.
- e) Grinnell Corporation.
- f) Gulf Valve Co.
- g) Metraflex Co.
- h) Mueller Steam Specialty.
- i) NIBCO INC.
- j) Red-White Valve Corp.

- k) SSI Equipment, Inc.
 - l) Techno Corp.
 - m) Val-Matic Valve & Mfg. Corp.
 - n) Valve and Primer Corp.
 - o) Watts Industries, Inc.; Water Products Div.
- 3) Dual-Plate, Ferrous-Alloy, Wafer-Lug Check Valves:
 - a) Crane Co.; Crane Valve Group; Crane Valves.
 - b) Gulf Valve Co.
 - c) Valve and Primer Corp.
 - 4) Dual-Plate, Ferrous-Alloy, Double-Flanged-Type Check Valves:
 - a) Crane Co.; Crane Valve Group; Crane Valves.
 - b) Gulf Valve Co.
 - c) Techno Corp.
 - 5) Ferrous-Alloy Wafer Check Valves, General: API 594, spring loaded.
 - 6) Single-Plate, Class 125 or 150, Ferrous-Alloy, Wafer Check Valves: Flangeless body.
 - 7) Single-Plate, Class 250 or 300, Ferrous-Alloy, Wafer Check Valves: Flangeless body.
 - 8) Single-Plate, Class 125 or 150, Ferrous-Alloy, Wafer-Lug Check Valves: Single-flange body.
 - 9) Single-Plate, Class 250 or 300, Ferrous-Alloy, Wafer-Lug Check Valves: Single-flange body.
 - 10) Single-Plate, Class 125 or 150, Ferrous-Alloy, Double-Flanged Check Valves: Flanged-end body.
 - 11) Single-Plate, Class 250 or 300, Ferrous-Alloy, Double-Flanged Check Valves: Flanged-end body.
 - 12) Dual-Plate, Class 125 or 150, Ferrous-Alloy, Wafer Check Valves: Flangeless body.
 - 13) Dual-Plate, Class 250 or 300, Ferrous-Alloy, Wafer Check Valves: Flangeless body.
 - 14) Dual-Plate, Class 125 or 150, Ferrous-Alloy, Wafer-Lug Check Valves: Single-flange body.
 - 15) Dual-Plate, Class 250 or 300, Ferrous-Alloy, Wafer-Lug Check Valves: Single-flange body.
 - 16) Dual-Plate, Class 125 or 150, Ferrous-Alloy, Double-Flanged Check Valves: Flanged-end body.

- 17) Dual-Plate, Class 250 or 300, Ferrous-Alloy, Double-Flanged Check Valves: Flanged-end body.

E. SPRING-LOADED, LIFT-DISC CHECK VALVES

1. Available Manufacturers:

a. Manufacturers:

b. Not be used for compressed-air or steam services.

1) Type I, Wafer Lift-Disc Check Valves:

a) Mueller Steam Specialty.

b) Or approved equal.

2) Type II, Compact-Wafer, Lift-Disc Check Valves:

a) Durabla Fluid Technology, Inc.

b) Flomatic Valves.

c) GA Industries, Inc.

d) Grinnell Corporation.

e) Hammond Valve.

f) Metraflex Co.

g) Milwaukee Valve Company.

h) Mueller Steam Specialty.

i) Multiplex Manufacturing Co.

j) NIBCO INC.

k) SSI Equipment, Inc.

l) Val-Matic Valve & Mfg. Corp.

m) Valve and Primer Corp.

3) Type III, Globe Lift-Disc Check Valves:

a) Durabla Fluid Technology, Inc.

b) Flomatic Valves.

c) GA Industries, Inc.

d) Grinnell Corporation.

e) Hammond Valve.

f) Metraflex Co.

g) Milwaukee Valve Company.

h) Multiplex Manufacturing Co.

- i) NIBCO INC.
 - j) SSI Equipment, Inc.
 - k) Val-Matic Valve & Mfg. Corp.
 - l) Valve and Primer Corp.
- 4) Type IV, Threaded Lift-Disc Check Valves:
- a) Check-All Valve Mfg. Co.
 - b) Durabla Fluid Technology, Inc.
 - c) Grinnell Corporation.
 - d) Legend Valve & Fitting, Inc.
 - e) Metraflex Co.
 - f) Milwaukee Valve Company.
 - g) Mueller Steam Specialty.
 - h) NIBCO INC.
 - i) Watts Industries, Inc.; Water Products Div.
- 5) Lift-Disc Check Valves, General: FCI 74-1, with spring-loaded bronze or alloy disc and bronze or alloy seat.
- 6) Type I, Class 125, Wafer Lift-Disc Check Valves: Wafer style with cast-iron shell with diameter matching companion flanges.
- 7) Type I, Class 250, Wafer Lift-Disc Check Valves: Wafer style with cast-iron shell with diameter matching companion flanges.
- 8) Type II, Class 125, Compact-Wafer, Lift-Disc Check Valves: Compact-wafer style with cast-iron shell with diameter made to fit within bolt circle.
- 9) Type II, Class 250, Compact-Wafer, Lift-Disc Check Valves: Compact-wafer style with cast-iron shell with diameter made to fit within bolt circle.
- 10) Type III, Class 125, Globe Lift-Disc Check Valves: Globe style with cast-iron shell and flanged ends.
- 11) Type III, Class 250, Globe Lift-Disc Check Valves: Globe style with cast-iron shell and flanged ends.
- 12) Type IV, Class 125, Threaded Lift-Disc Check Valves: Threaded style with bronze shell and threaded ends.
- 13) Type IV, Class 150, Threaded Lift-Disc Check Valves: Threaded style with bronze shell and threaded ends.

F. BRONZE GATE VALVES

I. Available Manufacturers:

a. Manufacturers:

- 1) Type 1, Bronze, Nonrising-Stem Gate Valves:
 - a) American Valve, Inc.
 - b) Cincinnati Valve Co.
 - c) Crane Co.; Crane Valve Group; Crane Valves.
 - d) Crane Co.; Crane Valve Group; Jenkins Valves.
 - e) Crane Co.; Crane Valve Group; Stockham Div.
 - f) Grinnell Corporation.
 - g) Hammond Valve.
 - h) Kitz Corporation of America.
 - i) Legend Valve & Fitting, Inc.
 - j) Milwaukee Valve Company.
 - k) NIBCO INC.
 - l) Powell, Wm. Co.
 - m) Red-White Valve Corp.
 - n) Walworth Co.
 - o) Watts Industries, Inc.; Water Products Div.

- 2) Type 2, Bronze, Rising-Stem, Solid-Wedge Gate Valves:
 - a) American Valve, Inc.
 - b) Cincinnati Valve Co.
 - c) Crane Co.; Crane Valve Group; Crane Valves.
 - d) Crane Co.; Crane Valve Group; Jenkins Valves.
 - e) Crane Co.; Crane Valve Group; Stockham Div.
 - f) Grinnell Corporation.
 - g) Hammond Valve.
 - h) Kitz Corporation of America.
 - i) Milwaukee Valve Company.
 - j) NIBCO INC.
 - k) Powell, Wm. Co.
 - l) Red-White Valve Corp.
 - m) Walworth Co.

- 3) Type 3, Bronze, Rising-Stem, Split-Wedge Gate Valves:
 - a) Cincinnati Valve Co.

- b) Crane Co.; Crane Valve Group; Jenkins Valves.
 - c) Grinnell Corporation.
 - d) NIBCO INC.
- 4) Bronze Gate Valves, General: MSS SP-80, with ferrous-alloy hand-wheel.
 - 5) Type 1, Class 125, Bronze Gate Valves: Bronze body with nonrising stem and bronze solid wedge and union-ring bonnet.
 - 6) Type 1, Class 150, Bronze Gate Valves: Bronze body with nonrising stem and bronze solid wedge and union-ring bonnet.
 - 7) Type 1, Class 200, Bronze Gate Valves: Bronze body with nonrising stem and bronze solid wedge and union-ring bonnet.
 - 8) Type 2, Class 125, Bronze Gate Valves: Bronze body with rising stem and bronze solid wedge and union-ring bonnet.
 - 9) Type 2, Class 150, Bronze Gate Valves: Bronze body with rising stem and bronze solid wedge and union-ring bonnet.
 - 10) Type 2, Class 200, Bronze Gate Valves: Bronze body with rising stem and bronze solid wedge and union-ring bonnet.
 - 11) Type 3, Class 125, Bronze Gate Valves: Bronze body with rising stem and bronze split wedge and union-ring bonnet.
 - 12) Type 3, Class 150, Bronze Gate Valves: Bronze body with rising stem and bronze split wedge and union-ring bonnet.
 - 13) Type 3, Class 200, Bronze Gate Valves: Bronze body with rising stem and bronze split wedge and union-ring bonnet.

G. CAST-IRON GATE VALVES

I. Available Manufacturers:

a. Manufacturers:

- 1) Type I, Cast-Iron, Nonrising-Stem Gate Valves:
 - a) Cincinnati Valve Co.
 - b) Crane Co.; Crane Valve Group; Crane Valves.
 - c) Crane Co.; Crane Valve Group; Jenkins Valves.
 - d) Crane Co.; Crane Valve Group; Stockham Div.
 - e) Grinnell Corporation.
 - f) Hammond Valve.
 - g) Kitz Corporation of America.
 - h) Legend Valve & Fitting, Inc.
 - i) Milwaukee Valve Company.

- j) NIBCO INC.
 - k) Powell, Wm. Co.
 - l) Red-White Valve Corp.
 - m) Walworth Co.
 - n) Watts Industries, Inc.; Water Products Div.
- 2) Type 1, Cast-Iron, Rising-Stem Gate Valves:
- a) Cincinnati Valve Co.
 - b) Crane Co.; Crane Valve Group; Crane Valves.
 - c) Crane Co.; Crane Valve Group; Jenkins Valves.
 - d) Crane Co.; Crane Valve Group; Stockham Div.
 - e) Grinnell Corporation.
 - f) Hammond Valve.
 - g) Kitz Corporation of America.
 - h) Legend Valve & Fitting, Inc.
 - i) Milwaukee Valve Company.
 - j) NIBCO INC.
 - k) Powell, Wm. Co.
 - l) Red-White Valve Corp.
 - m) Walworth Co.
 - n) Watts Industries, Inc.; Water Products Div.
- 3) Cast-Iron Gate Valves, General: MSS SP-70, Type 1.
- 4) Class 125, NRS, Bronze-Mounted, Cast-Iron Gate Valves: Cast-iron body with bronze trim, nonrising stem, and solid-wedge disc.
- 5) Class 125, OS&Y, Bronze-Mounted, Cast-Iron Gate Valves: Cast-iron body with bronze trim, rising stem, and solid-wedge disc.
- 6) Class 125, NRS, All-Iron, Cast-Iron Gate Valves: Cast-iron body with cast-iron trim, nonrising stem, and solid-wedge disc.
- 7) Class 125, OS&Y, All-Iron, Cast-Iron Gate Valves: Cast-iron body with cast-iron trim, rising stem, and solid-wedge disc.
- 8) Class 250, NRS, Bronze-Mounted, Cast-Iron Gate Valves: Cast-iron body with bronze trim, nonrising stem, and solid-wedge disc.
- 9) Class 250, OS&Y, Bronze-Mounted, Cast-Iron Gate Valves: Cast-iron body with bronze trim, rising stem, and solid-wedge disc.
- 10) Class 250, NRS, All-Iron, Cast-Iron Gate Valves: Cast-iron body with cast-iron trim, nonrising stem, and solid-wedge disc.

- 11) Class 250, OS&Y, All-Iron, Cast-Iron Gate Valves: Cast-iron body with cast-iron trim, rising stem, and solid-wedge disc.

H. BRONZE GLOBE VALVES

1. Available Manufacturers:

a. Manufacturers:

1) Type 1, Bronze Globe Valves with Metal Disc:

- a) Cincinnati Valve Co.
- b) Crane Co.; Crane Valve Group; Crane Valves.
- c) Crane Co.; Crane Valve Group; Jenkins Valves.
- d) Crane Co.; Crane Valve Group; Stockham Div.
- e) Grinnell Corporation.
- f) Hammond Valve.
- g) Kitz Corporation of America.
- h) Legend Valve & Fitting, Inc.
- i) Milwaukee Valve Company.
- j) NIBCO INC.
- k) Powell, Wm. Co.
- l) Red-White Valve Corp.
- m) Walworth Co.

2) Type 2, Bronze Globe Valves with Nonmetallic Disc:

- a) Cincinnati Valve Co.
- b) Crane Co.; Crane Valve Group; Crane Valves.
- c) Crane Co.; Crane Valve Group; Jenkins Valves.
- d) Crane Co.; Crane Valve Group; Stockham Div.
- e) Grinnell Corporation.
- f) Hammond Valve.
- g) Kitz Corporation of America.
- h) McWane, Inc.; Kennedy Valve Div.
- i) Milwaukee Valve Company.
- j) NIBCO INC.
- k) Powell, Wm. Co.
- l) Red-White Valve Corp.

- m) Walworth Co.
- 3) Type 3, Bronze Globe Valves with Renewable Seat and Metal Disc:
 - a) Cincinnati Valve Co.
 - b) Crane Co.; Crane Valve Group; Crane Valves.
 - c) Crane Co.; Crane Valve Group; Jenkins Valves.
 - d) Crane Co.; Crane Valve Group; Stockham Div.
 - e) Grimmell Corporation.
 - f) Hammond Valve.
 - g) Milwaukee Valve Company.
 - h) NIBCO INC.
 - i) Walworth Co.
- 4) Bronze Globe Valves, General: MSS SP-80, with ferrous-alloy hand-wheel.
- 5) Type 1, Class 125, Bronze Globe Valves: Bronze body with bronze disc and union-ring bonnet.
- 6) Type 1, Class 150, Bronze Globe Valves: Bronze body with bronze disc and union-ring bonnet.
- 7) Type 1, Class 200, Bronze Globe Valves: Bronze body with bronze disc and union-ring bonnet.
- 8) Type 2, Class 125, Bronze Globe Valves: Bronze body with PTFE or TFE disc and union-ring bonnet.
- 9) Type 2, Class 150, Bronze Globe Valves: Bronze body with PTFE or TFE disc and union-ring bonnet.
- 10) Type 2, Class 200, Bronze Globe Valves: Bronze body with PTFE or TFE disc and union-ring bonnet.
- 11) Type 3, Class 125, Bronze Globe Valves: Bronze body with bronze disc and renewable seat. Include union-ring bonnet.
- 12) Type 3, Class 150, Bronze Globe Valves: Bronze body with bronze disc and renewable seat. Include union-ring bonnet.
- 13) Type 3, Class 200, Bronze Globe Valves: Bronze body with bronze disc and renewable seat. Include union-ring bonnet.

I. CAST-IRON GLOBE VALVES

1. Available Manufacturers:

a. Manufacturers:

- 1) Type 1, Cast-Iron Globe Valves with Metal Seats:
 - a) Cincinnati Valve Co.

- b) Crane Co.; Crane Valve Group; Crane Valves.
 - c) Crane Co.; Crane Valve Group; Jenkins Valves.
 - d) Crane Co.; Crane Valve Group; Stockham Div.
 - e) Grinnell Corporation.
 - f) Hammond Valve.
 - g) Kitz Corporation of America.
 - h) Milwaukee Valve Company.
 - i) NIBCO INC.
 - j) Powell, Wm. Co.
 - k) Red-White Valve Corp.
 - l) Walworth Co.
- 2) Cast-Iron Globe Valves, General: MSS SP-85.
 - 3) Type I, Class 125, Cast-Iron Globe Valves: Gray-iron body with bronze seats.
 - 4) Type I, Class 250, Cast-Iron Globe Valves: Gray-iron body with bronze seats.

J. CAST-IRON PLUG VALVES

I. Available Manufacturers:

a. Manufacturers:

- 1) Lubricated-Type, Cast-Iron Plug Valves:
 - a) Milliken Valve Co., Inc.
 - b) Nordstrom Valves, Inc.
 - c) Olson Technologies; Homestead Div.
 - d) R & M Energy Systems (Tomball, TX).
 - e) Walworth Co.
- 2) Nonlubricated-Type, Cast-Iron Plug Valves:
 - a) General Signal; DeZurik Unit.
 - b) Grinnell Corporation.
 - c) Mueller Flow Technologies.
 - d) Tyco International, Ltd.; Tyco Valves & Controls.
 - e) Wheatley Gaso, Inc.
 - f) Xomox Corporation.
- 3) Cast-Iron Plug Valves. General: MSS SP-78.

- 4) Class 125 or 150, lubricated-type, cast-iron plug valves.
- 5) Class 250 or 300, lubricated-type, cast-iron plug valves.
- 6) Class 125 or 150, nonlubricated-type, cast-iron plug valves.
- 7) Class 250, nonlubricated-type, cast-iron plug valves.

K. RESILIENT-SEATED, CAST-IRON, ECCENTRIC PLUG VALVES

1. Available Manufacturers:

a. Manufacturers:

- 1) General Signal; DeZurik Unit.
- 2) Milliken Valve Company.
- 3) Olson Technologies; Homestead Div.
- 4) Pratt, Henry Company.
- 5) Val-Matic Valve & Mfg. Corp.

- b. The standard for resilient-seated, eccentric plug valves covers NPS 3 and larger. Similar smaller valves are available.
- c. Resilient-Seated, Cast-Iron, Eccentric Plug Valves, NPS 2-1/2 and Smaller: Design similar to MSS SP-108, and rated for 175-psi minimum CWP.
- d. Resilient Seating Material: Suitable for potable-water service, unless otherwise indicated.
- e. Resilient-Seated, Cast-Iron, Eccentric Plug Valves, NPS 3 and Larger: MSS SP-108, and rated for 175-psi minimum CWP.
- f. Resilient Seating Material: Suitable for potable-water service, unless otherwise indicated.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- D. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- E. Examine threads on valve and mating pipe for form and cleanliness.
- F. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- G. Do not attempt to repair defective valves; replace with new valves.

3.02 VALVE APPLICATIONS

- A. Refer to piping Sections for specific valve applications. If valve applications are not indicated, use the following:
1. Shutoff Service: Ball, butterfly, or gate valves.
 2. Throttling Service: Angle, ball, butterfly, or globe valves.
 3. Pump Discharge: Spring-loaded, lift-disc check valves.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.
- C. Condenser Water Piping: Use the following types of valves:
1. Ball Valves, NPS 2 and Smaller: One, Two or Three -piece, 400-psig/600-psig CWP rating, copper alloy. Ball Valves, NPS 2-1/2 and Larger: Class 150, 300, ferrous alloy.
 2. Single-flange or flanged butterfly valves in subparagraph below are required for dead-end service.
 3. Butterfly Valves, NPS 2-1/2 and Larger: Flanged 150-psig, 175-psig, 200-psig, 250-psig, 300-psig CWP rating, ferrous alloy, with [EPDM] liner.
 4. Single-flange, high-pressure butterfly valves in subparagraph below are required for dead-end service.
 5. High-Pressure Butterfly Valves, NPS 3 and Larger: Single-flange, Class 150, 300.
 6. Grooved-End, Ductile-Iron Butterfly Valves, NPS 2-1/2 and Larger: 175-psig/300-psig CWP rating.
 7. Lift Check Valves, NPS 2 and Smaller: Type 2, Class 125, 150, 200 horizontal or vertical, bronze.
 8. Swing Check Valves, NPS 2 and Smaller: Type 4, Class 125, 150, 200, bronze.
 9. Swing Check Valves, NPS 2-1/2 and Larger: Type II, Class 125, 250, gray iron.
 10. Grooved-End, Ductile-Iron, Swing Check Valves, NPS 2-1/2 and Larger: 175-psig/300-psig CWP rating.
 11. Wafer Check Valves, NPS 2-1/2 and Larger: Dual-plate, double-flanged, Class 125 or 150, 250 or 300, ferrous alloy.
 12. Spring-Loaded, Lift-Disc Check Valves, NPS 2 and Smaller: Type IV, Class 125 minimum, 150, 200.
 13. Spring-Loaded, Lift-Disc Check Valves, NPS 2-1/2 and Larger: Type I or II, Class 125, 250, cast iron.
 14. Gate Valves, NPS 2 and Smaller: Type 2 or 3, Class 125, 150, 200, bronze.
 15. Gate Valves, NPS 2-1/2 and Larger: Type I, Class 125, 250, NRS, OS&Y, bronze-mounted cast iron.
 16. Globe Valves, NPS 2 and Smaller: Type 2, Class 125, 150, 200, bronze.
 17. Globe Valves, NPS 2-1/2 and Larger: Type I, Class 125, 250, bronze-mounted cast iron.
 18. Plug Valves, NPS 2 and Larger: Class 125 or 150, 250 or 300, lubricated-type, cast iron.

19. Verify that eccentric plug valves are suitable for fluid temperature; delete subparagraph below if not suitable.
20. Resilient-Seated, Eccentric Plug Valves, NPS 3 and Larger: 175-psig CWP rating, cast iron.
21. Domestic Water Piping: Use the following types of valves:
22. Angle Valves, NPS 2 and Smaller: Type 2, Class 125, 150, 200, bronze. Angle Valves, NPS 2-1/2 and Larger: Type II, Class 125, 250, cast iron.
23. Ball Valves, NPS 2 and Smaller: One/Two/ Three-piece, 400-psig 600-psig CWP rating, copper alloy.
24. Ball Valves, NPS 2-1/2 and Larger: Class 150, 300, ferrous alloy.
25. Butterfly Valves, NPS 2-1/2 and Larger: Flanged, 150-psig, 175-psig, 200-psig, 250-psig, 300-psig CWP rating, ferrous alloy, with EPDM liner.
26. Grooved-End, Ductile-Iron Butterfly Valves, NPS 2-1/2 and Larger: 175-psig, 300-psig CWP rating.
27. Lift Check Valves, NPS 2 and Smaller: Type 2, Class 125, 150, 200 horizontal or vertical, bronze.
28. Swing Check Valves, NPS 2 and Smaller: Type 4, Class 125, 150, 200, bronze.
29. Swing Check Valves, NPS 2-1/2 and Larger: Type II, Class 125, 250, gray iron.
30. Grooved-End, Ductile-Iron, Swing Check Valves, NPS 2-1/2 and Larger: 175-psig 300-psig CWP rating.
31. Wafer Check Valves, NPS 2-1/2 and Larger: Dual-plate, double-flanged, Class 125 or 150, 250 or 300, ferrous alloy.
32. Spring-Loaded, Lift-Disc Check Valves, NPS 2 and Smaller: Type IV, Class 125 minimum 150, 200.
33. Spring-Loaded, Lift-Disc Check Valves, NPS 2-1/2 and Larger: Type I or II, III, Class 125, 250, cast iron.
34. Gate Valves, NPS 2 and Smaller: Type 1/2, Class 125, 150, 200, bronze.
35. Gate Valves, NPS 2-1/2 and Larger: Type 1, Class 125, 250, NRS, OS&Y, bronze-mounted cast iron.
36. Globe Valves, NPS 2 and Smaller: Type 2, Class 125, 150, 200, bronze.
37. Globe Valves, NPS 2-1/2 and Larger: Type 1, Class 125, 250, bronze-mounted cast iron.
38. Plug Valves, NPS 2 and Larger: Class 125 or 150, 250 or 300, [lubricated-type with FDA-approved-material sealant, cast iron.
39. Resilient-Seated, Eccentric Plug Valves, NPS 3 and Larger: 175-psig CWP rating, cast iron.

D. Heating Water Piping: Use the following types of valves:

1. Angle Valves, NPS 2 and Smaller: Type 2, Class 125, 150, 200, bronze.
2. Angle Valves, NPS 2-1/2 and Larger: Type II, Class 125, 250, cast iron.

3. Ball Valves, NPS 2 and Smaller: One, Two, Three-piece, 400-psig, 600-psig CWP rating, copper alloy.
4. Ball Valves, NPS 2-1/2 and Larger: Class 150, 300, ferrous alloy.
5. Butterfly Valves, NPS 2-1/2 and Larger: Flanged, 150-psig, 175-psig, 200-psig, 250-psig, 300-psig CWP rating, ferrous alloy, with EPDM liner.
6. High-Pressure Butterfly Valves, NPS 3 and Larger: Single-flange, Class 150, 300.
7. Grooved-End, Ductile-Iron Butterfly Valves, NPS 2-1/2 and Larger: 175-psig, 300-psig CWP rating.
8. Lift Check Valves, NPS 2 and Smaller: Type 2, Class 125, 150, 200, horizontal or vertical, bronze.
9. Swing Check Valves, NPS 2 and Smaller: Type 4, Class 125, 150, 200, bronze.
10. Swing Check Valves, NPS 2-1/2 and Larger: Type II, Class 125, 250, gray iron.
11. Grooved-End, Ductile-Iron, Swing Check Valves, NPS 2-1/2 and Larger: 300-psig CWP rating.
12. Wafer Check Valves, NPS 2-1/2 and Larger: Dual-plate, double-flanged, Class 250 or 300, ferrous alloy.
13. Spring-Loaded, Lift-Disc Check Valves, NPS 2 and Smaller: Type IV, Class 125 minimum 200.
14. Spring-Loaded, Lift-Disc Check Valves, NPS 2-1/2 and Larger: Type I or II, III, Class 250, cast iron.
15. Gate Valves, NPS 2 and Smaller: Type 2, 3 Class 125, 150, 200, bronze.
16. Gate Valves, NPS 2-1/2 and Larger: Type I, Class 125, 250, NRS, OS&Y, bronze-mounted cast iron.
17. Globe Valves, NPS 2 and Smaller: Type 2, Class 125, 150, 200, bronze.
18. Globe Valves, NPS 2-1/2 and Larger: Type 1, Class 125, 250, bronze-ounted cast iron.
19. Plug Valves, NPS 2 and Larger: Class 250 or 300, nonlubricated-type, cast iron.
20. Resilient-Seated, Eccentric Plug Valves, NPS 3 and Larger: 175-psig CWP rating, cast iron.

3.03 VALVE INSTALLATION

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- C. Locate valves for easy access and provide separate support where necessary.
- D. Install valves in horizontal piping with stem at or above center of pipe.
- E. Install valves in position to allow full stem movement.
- F. Install chainwheel operators on valves NPS 4 and larger and more than 96 inches above floor. Extend chains to 60 inches above finished floor elevation.

- G. Install check valves for proper direction of flow and as follows:
 - 1. Swing Check Valves: In horizontal position with hinge pin level.
 - 2. Dual-Plate Check Valves: In horizontal or vertical position, between flanges.
 - 3. Lift Check Valves: With stem upright and plumb.

3.04 JOINT CONSTRUCTION

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. Grooved Joints: Assemble joints with keyed coupling housing, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- C. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

3.05 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

END OF SECTION 15110

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SECTION 15121

PIPING EXPANSION COMPENSATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Expansion joints and compensators.
- B. Pipe loops, offsets, and swing joints.

1.02 RELATED SECTIONS

- A. Section 15181 -- "Hydronic Piping and Pipe Fittings".

1.03 REFERENCES

- A. MIL-E-17814E - Expansion Joints, Pipe, Slip-Type, Packed.

1.04 PERFORMANCE REQUIREMENTS

- A. Provide structural work and equipment required to control expansion and contraction of piping. Verify that anchors, guides, and expansion joints provided, adequately protect system.
- B. Expansion Calculations:
 - 1. Installation Temperature: 50 degrees F.
 - 2. Hot Water Heating: 210 degrees F.
 - 3. Safety Factor: 30 percent.

1.05 SUBMITTALS

- A. Submit under provisions of the General Conditions.
- B. Product Data:
 - 1. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.
- C. Design Data: Indicate selection calculations.
- D. Manufacturer's Installation Instructions: Indicate special procedures, and external controls.

1.06 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of General Conditions.
- B. Record actual locations of expansion joints, anchors, and guides.

1.07 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of General Conditions.
- B. Maintenance Data: Include adjustment instructions.

1.08 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of General Conditions.
- B. Accept expansion joints on site in factory packing with shipping bars and positioning devices intact. Inspect for damage.
- C. Protect equipment from exposure by leaving factory coverings, pipe end protection, and packaging in place until installation.

1.10 WARRANTY

- A. Provide manufacturer's five year warranty under provisions of General Conditions.
- B. Warranty: Include coverage for leak free performance of packed expansion joints.

1.11 EXTRA MATERIALS

- A. Furnish under provisions of General Conditions.
- B. Provide two 12 ounce containers of packing lubricant and cartridge style grease gun.

PART 2 - PRODUCTS

2.01 EXPANSION JOINTS

- A. Stainless Steel Bellows Type:
 - 1. Pressure Rating: 300 psig WSP and 400 degrees F.
 - 2. Maximum Compression: 3 inch.
 - 3. Maximum Extension: 1/4 inch.
 - 4. Joint: As specified for pipe joints.
 - 5. Size: Use pipe sized units.
 - 6. Application: Steel piping 3 inch and under.
- B. External Ring Controlled Stainless Steel Bellows Type:
 - 1. Pressure Rating: 300 psig WSP and 400 degrees F.
 - 2. Maximum Compression: 1-1/4 inch.
 - 3. Maximum Extension: 3/8 inch.
 - 4. Maximum Offset: 1/8 inch.
 - 5. Joint: Flanged.
 - 6. Size: Use pipe sized units.
 - 7. Accessories: Internal flow liner.
 - 8. Application: Steel piping over 3 inch.
- C. Two-Ply Bronze Bellows Type:
 - 1. Construction: Bronze with anti-torque device, limit stops, internal guides.

2. Pressure Rating: 300 psig WSP and 400 degrees F.
3. Maximum Compression: 3 inch.
4. Maximum Extension: 1/4 inch.
5. Joint: As specified for pipe joints.
6. Size: Use pipe sized units.
7. Application: Copper piping.

2.02 ACCESSORIES

- A. Pipe Alignment Guides:
 1. Two piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch (25 mm) thick insulation, minimum 3 inch travel.
- B. Swivel Joints:
 1. Fabricated steel, Bronze, Ductile Iron, Cast steel body, double ball bearing race, field lubricated, with rubber (Buna-N) o-ring seals.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Construct spool pieces to exact size of flexible connection for future insertion.
- C. Rigidly anchor pipe to building structure where necessary. Provide pipe guides so movement is directed along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.
- D. Provide support and equipment required to control expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required indicated.
- E. Provide victaulic piping with minimum one joint per (inch) pipe diameter instead of flexible connector supported by vibration isolation. Victaulic piping need not be anchored.
- F. Provide expansion loops as indicated on drawings.

3.02 MANUFACTURER'S FIELD SERVICES

- A. Prepare and start systems under provisions of DDC General Requirements.
- B. Provide inspection services by flexible pipe manufacturer's representative for final installing and certify installation is in accordance with manufacturer's recommendations and connectors are performing satisfactorily.

3.03 EXPANSION-JOINT INSTALLATION

- A. Install manufactured, nonmetallic expansion joints according to FSA's "Technical Handbook: Non-Metallic Expansion Joints and Flexible Pipe Connectors."
- B. Install expansion joints of sizes matching size of piping in which they are installed.
- C. Install alignment guides to allow expansion and to avoid end-loading and torsional stress.

3.04 PIPE BEND AND LOOP INSTALLATION

- A. Install pipe bends and loops cold-sprung in tension or compression as required to partly absorb tension or compression produced during anticipated change in temperature.
- B. Attach pipe bends and loops to anchors.
 - 1. Steel Anchors: Attach by welding. Comply with ASME B31.9 and ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
 - 2. Concrete Anchors: Attach by fasteners. Follow fastener manufacturer's written instructions.

3.05 SWING CONNECTIONS

- A. Connect risers and branch connections to mains with at least five pipe fittings, including tee in main.
- B. Connect risers and branch connections to terminal units with at least four pipe fittings, including tee in riser.
- C. Connect mains and branch connections to terminal units with at least four pipe fittings, including tee in main.

3.06 ALIGNMENT-GUIDE INSTALLATION

- A. Install guides on piping adjoining pipe expansion joints and bends and loops.
- B. Attach guides to pipe and secure to building structure.

3.07 ANCHOR INSTALLATION

- A. Install anchors at locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected equipment.
- B. Fabricate and install steel anchors by welding steel shapes, plates, and bars to piping and to structure. Comply with ASME B31.9 and AWS D1.1.
- C. Construct concrete anchors of poured-in-place concrete of dimensions indicated and include embedded fasteners.
- D. Install pipe anchors according to expansion-joint manufacturer's written instructions if expansion joints or compensators are indicated.
- E. Use grout to form flat bearing surfaces for expansion fittings, guides, and anchors installed on or in concrete.

END OF SECTION

SECTION 15135
GAGES AND METERS

PART 1 - GENERAL

1.01 SECTION INCLUDE

- A. Pressure gages and Pressure gage taps.
- B. Thermometers and thermometer wells.
- C. Static pressure gages.
- D. Filter gages.

1.02 RELATED SECTIONS

- A. Section 15181 – “Hydronic Piping and Pipe Fittings”.
- B. Section 15900 – “HVAC Instrumentation and Controls”
- C. Section 15985 - Sequence of Operation.

1.03 REFERENCES

- A. ASME - B40.1 - Gages - Pressure Indicating Dial Type - Elastic Element.
- B. ASTM E1 - Specification for ASTM Thermometers.
- C. ASTM E77 - Verification and Calibration of Liquid-in-Glass Thermometers.
- D. UL 393 - Indicating Pressure Gages for Fire and Protection Services.

1.04 SUBMITTALS FOR REVIEW

- A. General Conditions - Submittals: Procedures for submittals.
- B. Product Data: Provide list which indicates use, operating range, total range and location for manufactured components.

1.05 SUBMITTALS AT PROJECT CLOSEOUT

- A. General Conditions - Contract Closeout, Operation and Maintenance Data, Warranties and Bonds, Procedures for submittals.
- B. Project Record Documents: Record actual locations of components and instrumentation.
- C. Operation and Maintenance Data:

1.06 ENVIRONMENTAL REQUIREMENTS

- A. General Conditions - Material and Equipment: Environmental conditions affecting products on site.
- B. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

1.07 EXTRA MATERIALS

- A. General Conditions - Contract Closeout, Operation and Maintenance Data.

- B. Provide two bottles of red gage oil for static pressure gages.
- C. Provide two dial thermometers.

PART 2 – PRODUCTS

2.01 PRESSURE GAGES

- A. Gage: ASME B40.1, UL 393 drawn steel case, phosphor bronze bourdon tube, rotary brass movement, brass socket, with front recalibration adjustment, black scale on white background.
 - 1. Case: Cast aluminum with phosphor bronze bourdon tube.
 - 2. Size: 3-1/2 inch diameter.
 - 3. Mid-Scale Accuracy: two percent.
 - 4. Scale: Psi.

2.02 PRESSURE GAGE TAPPINGS

- A. Gage Cock: Tee or lever handle, brass for maximum 150 psig.
- B. Needle Valve: Brass, 1/4 inch NPT for minimum 150 psig.
 - 1. Pulsation Damper: Pressure snubber, brass with 1/4 inch connections.

2.03 STEM TYPE THERMOMETERS

- A. Thermometer: ASTM E1, adjustable angle, red appearing mercury, lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device.
 - 1. Size: 9 inch.
 - 2. Window: Clear glass.
 - 3. Stem: 3/4 inch NPT brass.
 - 4. Accuracy: 2 percent.
 - 5. Calibration: Degrees F.

2.04 DIAL THERMOMETERS

- A. Thermometer: ASTM E1, stainless steel case, adjustable angle with front recalibration, bimetallic helix actuated with silicone fluid damping, white with black markings and black pointer hermetically sealed lens, stainless steel stem.
 - 1. Size: 5 inch dial.
 - 2. Lens: Clear glass.
 - 3. Accuracy: 1 percent.
 - 4. Calibration: Degrees F.

2.05 THERMOMETER SUPPORTS

- A. Socket: Brass separable sockets for thermometer stems with or without extensions as required, and with cap and chain.

- B. Flange: 3 inch outside diameter reversible flange, designed to fasten to sheet metal air ducts, with brass perforated stem.

2.06 TEST PLUGS

- A. Test Plug: 1/4 inch or 1/2 inch brass fitting and cap for receiving 1/8 inch outside diameter pressure or temperature probe with [neoprene core for temperatures up to 200 degrees F.
- B. Test Kit: Carrying case, internally padded and fitted containing two 3-1/2 inch diameter pressure gages, two gage adapters with 1/8 inch probes, two 1-1/2 inch dial thermometers.

2.07 STATIC PRESSURE GAGES

- A. 3-1/2 inch diameter dial in metal case, diaphragm actuated, black figures on white background, front recalibration adjustment, 2 percent of full scale accuracy.
- B. Inclined manometer, red liquid on white background with black figures, front recalibration adjustment, 3 percent of full scale accuracy.
- C. Accessories: Static pressure tips with compression fittings for bulkhead mounting, 1/4 inch (6 mm) diameter tubing.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide three pressure gage per pump, installing taps before strainers and on suction and discharge of pump.
- C. Install pressure gages with pulsation dampers. Provide gage cock to isolate each gage. Extend nipples to allow clearance from insulation.
- D. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inch for installation of thermometer sockets. Ensure sockets allow clearance from insulation.
- E. Install thermometer sockets adjacent to controls systems thermostat, transmitter, or sensor sockets. Refer to Sections 15900 and 15985. Where thermometers are provided on local panels, duct or pipe mounted thermometers are provided on local panels, duct or pipe mounted thermometers are not required.
- F. Provide instruments with scale ranges selected according to service with largest appropriate scale.
- G. Install gages and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.
- H. Adjust gages and thermometers to final angle, clean windows and lenses, and calibrate to zero.
- I. Locate test plugs as defined in Section 15985.

3.02 PROVIDE AS ALSO SHOWN ON DRAWINGS

- A. Pressure Gage Schedule
 - 1. Location
 - a. Pumps
 - b. Expansion tanks

- c. Water supply
 - d. Pressure reducing valves
 - e. Backflow preventers
- B. Pressure Gage Tapping Schedule
 - 1. Location
 - a. Control valves 3/4 inch & larger
 - b. inlets and outlets
 - c. Major coils - inlets and outlets
- C. Stem Type Thermometer Schedule
 - 1. Location
 - a. Headers to central equipment
 - b. Coil banks - inlets and outlets
 - c. Heat exchangers - inlets and outlets
 - d. Water zone supply and return
 - e. After major coils
 - f. Domestic hot water supply and recirculation
- D. Thermometer Socket Schedule
 - 1. Location
 - a. Control valves 1 inch & larger
 - b. inlets and outlets
 - c. Cabinet heaters - inlets and outlets
 - d. Unit heaters - inlets and outlets
- E. Static Pressure and Filter Gage Schedule
 - 1. Location
 - a. Built up filter banks
 - b. Unitary filter sections
 - c. Supply fan discharge

END OF SECTION 15135

SECTION 15140
SUPPORT AND ANCHORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Pipe and equipment hangers and supports.
- B. Equipment bases and supports.
- C. Sleeves and seals.
- D. Flashing and sealing equipment and pipe stacks.

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Placement of inserts and sleeves in concrete formwork.
- B. Placement of roofing pipe and duct supports.
- C. Placement of equipment roof supports.

1.03 RELATED SECTIONS

- A. Section 15245 - Vibration Isolation.
- B. Section 15260 - Piping Insulation.
- C. Section 15181 - Hydronic Piping and Pipe Fittings.

1.04 REFERENCES

- A. ASME B31.9 - Building Services Piping.
- B. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
- C. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
- D. MSS SP69 - Pipe Hangers and Supports - Selection and Application.
- E. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.05 SUBMITTALS

- A. Submit under provisions of General Conditions.
- B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.
- C. Product Data: Provide manufacturers catalog data including load capacity.
- D. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
- E. Manufacturer's Installation Instructions: Indicate special procedures and assembly of components.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for support of hydronic piping.

PART 2 - PRODUCTS

2.01 PIPE HANGERS AND SUPPORT

- A. Hydronic Piping:
 - 1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69, MSS SP89.
 - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
 - 3. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 4. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
 - 5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 6. Vertical Support: Steel riser clamp.
 - 7. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 8. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.02 ACCESSORIES

- A. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

2.03 INSERTS

- A. Inserts: Malleable iron case or galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.04 FLASHING

- A. Metal Flashing: 26 gage galvanized steel.
- B. Metal Counterflashing: 22 gage galvanized steel.
- C. Lead Flashing:
 - 1. Waterproofing: 5 lb/sq ft sheet lead.
 - 2. Soundproofing: 1 lb/sq ft sheet lead.
- D. Flexible Flashing: 47 mil thick sheet butyl compatible with roofing.
- E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

2.05 EQUIPMENT CURBS

- A. Fabrication: Welded 18 gage galvanized steel shell and base, mitered 3 inch cant, variable step to match root insulation, factory installed wood nailer.

2.06 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or gage galvanized steel.

- C. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.
- D. Sleeves for Round Ductwork: Galvanized steel.
- E. Sleeves for Rectangular Ductwork: Galvanized steel or wood.
- F. Firestopping Insulation: Glass fiber type, non-combustible or 3M firestop caulking.
- G. Sealant: Acrylic.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.02 INSERTS

- A. Provide inserts for placement in concrete formwork.
- B. Provide inserts for suspending hangers from reinforced concrete slabs.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.03 PIPE HANGERS AND SUPPORTS

- A. Support horizontal piping as scheduled.
- B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- C. Place hangers within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support vertical piping at every floor.
- F. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- G. Support riser piping independently of connected horizontal piping.
- H. Provide copper plated hangers and supports for copper piping.
- I. Design hangers for pipe movement without disengagement of supported pipe.
- J. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.04 EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.

- C. Construct supports of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.05 FLASHING

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide acoustical sound caulking around ducts and pipes penetrating equipment rooms, installed in accordance with manufacturer's instructions for sound control.
- C. Provide curbs for mechanical roof installations 14 inches minimum high above roofing surface. Flash and counterflash with sheet metal; seal watertight. Attach counterflashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.
- D. Adjust storm collars tight to pipe with bolts; calk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.06 SLEEVES

- A. Set sleeves in position in formwork. Provide reinforcing around sleeves.
- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- C. Extend sleeves through floors one inch above finished floor level. Calk sleeves.
- D. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with fire stopping and calk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- E. Install chrome plated steel escutcheons at finished surfaces.

3.07 SCHEDULES

HANGER ROD

| <u>PIPE SIZE</u> | <u>MAX. HANGER SPACING</u> | <u>DIAMETER</u> |
|------------------|----------------------------|-----------------|
| Inches | Feet | Inches |
| 1/2 to 1-1/4 | 6.5 | 3/8 |
| 1-1/2 to 2 | 10 | 3/8 |
| 2-1/2 to 3 | 10 | 1/2 |

END OF SECTION 15140

SECTION 15171

ENCLOSED MOTOR CONTROLLERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Manual motor starters.
- B. Magnetic motor starters.
- C. Combination magnetic motor starters.

1.02 REFERENCES

- A. NFPA 70 - National Electrical Code.
- B. UL 198C - High-Interrupting Capacity Fuses; Current Limiting Type.
- C. UL 198E - Class R Fuses.
- D. NECA "Standard of Installation," published by National Electrical Contractors Association.
- E. NEMA AB 1 - Molded Case Circuit Breakers.
- F. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.
- G. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
- H. NEMA KS 1 - Enclosed Switches.

1.03 SUBMITTALS

- A. Submit under provisions of General Conditions.
- B. Product Data: Provide catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details.
- C. Test Reports: Indicate field test and inspection procedures and test results.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with NECA Standard of Installation.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.06 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.

- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

1.07 EXTRA MATERIALS

- A. Furnish under provisions of General Conditions.
- B. Provide three of each size and type fuse installed.

PART 2 - PRODUCTS

2.01 MANUAL CONTROLLERS

- A. Manual Motor Controller: NEMA ICS 2, AC general-purpose Class A manually operated, full-voltage controller with overload element, red pilot light, NO/NC auxiliary contact, and push button operator.
- B. Fractional Horsepower Manual Controller: NEMA ICS 2, AC general-purpose Class A manually operated, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, red pilot light, and toggle operator.
- C. Motor Starting Switch: NEMA ICS 2, AC general-purpose Class A manually operated, full-voltage controller for fractional horsepower induction motors, without thermal overload unit, with red pilot light and toggle operator.
- D. Enclosure: NEMA ICS 6; Type as required for service.

2.02 AUTOMATIC CONTROLLERS

- A. Magnetic Motor Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower.
- B. Coil operating voltage: 208 volts, 60 Hertz.
- C. Overload Relay: NEMA ICS; melting alloy.
- D. Enclosure: NEMA ICS 6, Type as required for service.

2.03 PRODUCT OPTIONS AND FEATURES

- A. Auxiliary Contacts: NEMA ICS 2, 4 each normally field convertible contacts in addition to seal-in contact.
- B. Cover Mounted Pilot Devices: NEMA ICS 2, heavy duty oiltight type.
- C. Pilot Device Contacts: NEMA ICS 2, Form Z, rated A150.
- D. Pushbuttons: Shrouded type.
- E. Indicating Lights: Resistor, incandescent type.
- F. Selector Switches: Rotary type.
- G. Relays: NEMA ICS 2.
- H. Control Power Transformers: 120 volt secondary, in each motor starter. Provide fused primary and secondary, and bond unfused leg of secondary to enclosure.

2.04 DISCONNECTS

- A. Combination Controllers: Combine motor controllers with fusible switch disconnect in common enclosure.
- B. Fusible Switch Assemblies: NEMA KS 1, enclosed knife switch with externally operable handle. Fuse clips: Designed to accommodate fuses.

2.05 FUSES

- A. Description: Dual element, current limiting, time delay, one-time fuse, 250 volt.
- B. Interrupting Rating: 200,000 rms amperes.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install enclosed controllers where indicated, in accordance with manufacturer's instructions.
- B. Install enclosed controllers plumb. Provide supports as required to permanently mount starter.
- C. Height: 5 ft to operating handle.
- D. Install fuses in fusible switches.
- E. Select and install overload heater elements in motor controllers to match installed motor characteristics.
- F. Provide engraved plastic nameplates.
- G. Provide neatly typed label inside each motor controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

3.02 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 15990.
- B. Inspect and test each enclosed controller to NEMA ICS 2.

END OF SECTION 15171

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SECTION 15181

HYDRONIC PIPING AND PIPE FITTINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

- A. This Section includes pipe and fitting materials, joining methods, special-duty valves, and specialties for the following:
1. Hot-water heating piping.
 2. Makeup-water piping.
 3. Condensate-drain piping.
 4. Blowdown-drain piping.
 5. Air-vent piping.
 6. Safety-valve-inlet and -outlet piping.

- B. Related Sections include the following:

1.03 DEFINITIONS

- A. PTFE: Polytetrafluoroethylene.
- B. RTRF and RTRP in two paragraphs below are ASTM abbreviations.
- C. RTRF: Reinforced thermosetting resin (fiberglass) fittings.
- D. RTRP: Reinforced thermosetting resin (fiberglass) pipe.

1.04 PERFORMANCE REQUIREMENTS

- A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature:
1. Hot-Water Heating Piping: at 200 deg F (93 deg C) .
 2. Makeup-Water Piping: 80 psig (552 kPa)] at 150 deg F (66 deg C).
 3. Condensate-Drain Piping: 150 deg F (66 deg C) .
 4. Blowdown-Drain Piping: 200 deg F (93 deg C).
 5. Air-Vent Piping: 200 deg F (93 deg C).
 6. Safety-Valve-Inlet and -Outlet Piping: Equal to the pressure of the piping system to which it is attached.

1.05 SUBMITTALS

Rugby Branch Library Renovation
LBKA05RUG

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Hydronic Piping and Pipe Fittings
(11-20-15)

- A. Product Data: For each type of the following:
 - 1. Plastic pipe and fittings with solvent cement.
 - 2. RTRP and RTRF with adhesive.
 - 3. Pressure-seal fittings.
 - 4. Valves. Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
 - 5. Air control devices.
 - 6. Chemical treatment.
 - 7. Hydronic specialties.
- B. Shop Drawings: Detail, at 3/8" = 1' scale, the piping layout, fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to the building structure. Detail location of anchors, alignment guides, and expansion joints and loops.
- C. Welding certificates.
- D. Qualification Data: For Installer.
- E. Field quality-control test reports.
- F. Operation and Maintenance Data: For air control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.
- G. Water Analysis: Submit a copy of the water analysis to illustrate water quality available at Project site.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installers of Pressure-Sealed Joints: Installers shall be certified by the pressure-seal joint manufacturer as having been trained and qualified to join piping with pressure-seal pipe couplings and fittings.
 - 2. Fiberglass Pipe and Fitting Installers: Installers of RTRF and RTRP shall be certified by the manufacturer of pipes and fittings as having been trained and qualified to join fiberglass piping with manufacturer-recommended adhesive.
- B. Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
 - 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

1.07 EXTRA MATERIALS

- A. Water-Treatment Chemicals: Furnish enough chemicals for initial system startup and for preventive maintenance for one year from date of Substantial Completion.
- B. Differential Pressure Meter: For each type of balancing valve and automatic flow control valve, include flowmeter, probes, hoses, flow charts, and carrying case.

PART 2 PRODUCTS

2.01 COPPER TUBE AND FITTINGS

- A. Drawn-Temper Copper Tubing: ASTM B 88, Type L (ASTM B 88M, Type B).
- B. Annealed-Temper Copper Tubing: ASTM B 88, Type K (ASTM B 88M, Type A).
- C. DWV Copper Tubing: ASTM B 306, Type DWV.
- D. Wrought-Copper Fittings: ASME B16.22.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anvil International, Inc.
 - b. S. P. Fittings; a division of Star Pipe Products.
 - c. Victaulic Company of America.
- E. Copper or Bronze Pressure-Seal Fittings:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Stadler-Viega.
 - b. Or approved equal.
 - 2. Housing: Copper.
 - 3. O-Rings and Pipe Stops: EPDM.
 - 4. Tools: Manufacturer's special tools.
 - 5. Minimum 200-psig (1379-kPa) working-pressure rating at 250 deg F (121 deg C).

2.02 STEEL PIPE AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; type, grade, and wall thickness as indicated in Part 3 "Piping Applications" Article.
- B. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250 as indicated in Part 3 "Piping Applications" Article.
- C. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in Part 3 "Piping Applications" Article.

- D. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in Part 3 "Piping Applications" Article.
- E. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced as indicated in Part 3 "Piping Applications" Article.
- F. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.
- G. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
 - 1. Material Group: 1.1.
 - 2. End Connections: Butt welding.
 - 3. Facings: Raised face.
- H. Grooved Mechanical-Joint Fittings and Couplings:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anvil International, Inc.
 - b. Central Sprinkler Company; a division of Tyco Fire & Building Products.
 - c. National Fittings, Inc.
 - d. S. P. Fittings; a division of Star Pipe Products.
 - e. Victaulic Company of America.
 - 2. Couplings: Ductile- or malleable-iron housing and synthetic rubber gasket of central cavity pressure-responsive design; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.
- I. Steel Pressure-Seal Fittings:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Victaulic Company of America.
 - b. Grinell.
 - c. Gruv-lock.
 - 3. Housing: Steel.
 - 4. O-Rings and Pipe Stop: EPDM.
 - 5. Tools: Manufacturer's special tool.
 - 6. Minimum 300-psig (2070-kPa) working-pressure rating at 230 deg F (110 deg C).

- J. Steel Pipe Nipples: ASTM A 733, made of same materials and wall thicknesses as pipe in which they are installed.

2.03 JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
 - 1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
- B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- D. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BA9-1, silver alloy for joining copper with bronze or steel.
- E. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.04 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper-alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Unions:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Capitol Manufacturing Company.
 - b. Central Plastics Company.
 - c. Hart Industries International, Inc.
 - d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - e. Zurn Plumbing Products Group; AquaSpec Commercial Products Division.
 - 2. Factory-fabricated union assembly, for 300-psig minimum working pressure at 180 deg F
- D. Dielectric Flanges:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Capitol Manufacturing Company.
 - b. Central Plastics Company.
 - c. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
3. Factory-fabricated companion-flange assembly, for 300-psig (1035- or 2070-kPa) minimum working pressure as required to suit system pressures.
- E. Dielectric-Flange Kits:
- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Central Plastics Company.
 - d. Pipeline Seal and Insulator, Inc.
 - 2. Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
 - 3. Separate companion flanges and steel bolts and nuts shall have 300-psig (1035- or 2070-kPa) minimum working pressure where required to suit system pressures.
- F. Dielectric Couplings:
- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Calpico, Inc.
 - b. Lochinvar Corporation.
 - c. Grinnell.
 - 2. Galvanized-steel coupling with inert and noncorrosive thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F .
- G. Dielectric Nipples:
- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Perfection Corporation; a subsidiary of American Meter Company.
 - b. Precision Plumbing Products, Inc.
 - c. Sioux Chief Manufacturing Company, Inc.
 - d. Victaulic Company of America.

2. Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F (107 deg C).

2.05 VALVES

- A. Gate, Globe, Check, Ball, and Butterfly Valves: Comply with requirements specified in Division 15 Section "Valves."
- B. Automatic Temperature-Control Valves, Actuators, and Sensors: Comply with requirements specified in Division 15 Section "HVAC Instrumentation and Controls."
- C. Cast-Iron or Steel, Calibrated-Orifice, Balancing Valves:
 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 3. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - a. Armstrong Pumps, Inc.
 - b. Bell & Gossett Domestic Pump; a division of ITT Industries.
 - c. Griswold Controls.
 4. Body: Cast-iron or steel body, ball, plug, or globe pattern with calibrated orifice or venturi.
 5. Ball: Brass or stainless steel.
 6. Stem Seals: EPDM O-rings.
 7. Disc: Glass and carbon-filled PTFE.
 8. Seat: PTFE.
 9. End Connections: Flanged or grooved.
 10. Pressure Gage Connections: Integral seals for portable differential pressure meter.
 11. Handle Style: Lever, with memory stop to retain set position.
 12. CWP Rating: Minimum 125 psig (860 kPa).
 13. Maximum Operating Temperature: 250 deg F (121 deg C).

2.06 AIR CONTROL DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Amtrol, Inc.

2. Armstrong Pumps, Inc.
 3. Bell & Gossett Domestic Pump; a division of ITT Industries.
 4. Taco.
- B. Air vents aid in system filling. Air removal after initial startup is accomplished by air separator or boiler dip-tube.
- C. Manual Air Vents:
1. Body: Bronze.
 2. Internal Parts: Nonferrous.
 3. Operator: Screwdriver or thumbscrew.
 4. Inlet Connection: NPS 1/2 (DN 15).
 5. Discharge Connection: NPS 1/8 (DN 6).
 6. CWP Rating: 150 psig (1035 kPa).
 7. Maximum Operating Temperature: 225 deg F (107 deg C).

2.07 HYDRONIC PIPING SPECIALTIES

- A. Y-Pattern Strainers:
1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
 2. End Connections: Threaded ends for NPS 2 (DN 50) and smaller; flanged ends for NPS 2-1/2 (DN 65) and larger.
 3. Strainer Screen: 40-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
 4. CWP Rating: 300 psig .
- B. Basket Strainers:
1. Body: ASTM A 126, Class B, high-tensile cast iron with bolted cover and bottom drain connection.
 2. End Connections: Threaded ends for NPS 2 (DN 50) and smaller; flanged ends for NPS 2-1/2 (DN 65) and larger.
 3. Strainer Screen: 60-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
 4. CWP Rating: 300 psig .
- C. Combinations of grooved mechanical-joint couplings and short nipples may also be used. Refer to Victaulic's technical information.
- D. Stainless-Steel Bellow, Flexible Connectors:
1. Body: Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.

2. End Connections: Threaded or flanged to match equipment connected.
 3. Performance: Capable of 3/4-inch (20-mm) misalignment.
 4. CWP Rating: 300 psig.
 5. Maximum Operating Temperature: 250 deg F (121 deg C).
- E. Spherical, Rubber, Flexible Connectors:
1. Body: Fiber-reinforced rubber body.
 2. End Connections: Steel flanges drilled to align with Classes 150 and 300 steel flanges.
 3. Performance: Capable of misalignment.
 4. CWP Rating: 150 psig (1035 kPa).
 5. Maximum Operating Temperature: 250 deg F (121 deg C).
- F. Expansion fittings are specified in Division 15 Section "Pipe Expansion Fittings and Loops."

PART 3 EXECUTION

3.01 PIPING APPLICATIONS

- A. Hot-water heating piping, aboveground, 2 inches and smaller, shall be any of the following:
1. Schedule 40 steel pipe; cast-iron flanges and flange fittings; and threaded joints.
- B. Makeup-water piping installed aboveground shall be [either of] the following:
1. Type L (B) drawn-temper copper tubing, wrought-copper fittings, and soldered joints.
- C. Condensate-Drain Piping: Type M drawn-temper copper tubing, wrought-copper fittings, and soldered joints.
- D. Air-Vent Piping:
1. Inlet: Same as service where installed with metal-to-plastic transition fittings for plastic piping systems according to the piping manufacturer's written instructions.
 2. Outlet: Type K (A), annealed-temper copper tubing with soldered or flared joints.
- E. Safety-Valve-Inlet and -Outlet Piping for Hot-Water Piping: Same materials and joining methods as for piping specified for the service in which safety valve is installed with metal-to-plastic transition fittings for plastic piping systems according to the piping manufacturer's written instructions.

3.02 VALVE APPLICATIONS

- A. Install shutoff-duty valves at each branch connection to supply mains, and at supply connection to each piece of equipment.
- B. Install calibrated-orifice, balancing valves at each branch connection to return main.
- C. Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal.
- D. Install check valves at each pump discharge and elsewhere as required to control flow direction.

- E. Install safety valves at hot-water generators and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install drip-pan elbow on safety-valve outlet and pipe without valves to the outdoors; and pipe drain to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, for installation requirements.
- F. Install pressure-reducing valves at makeup-water connection to regulate system fill pressure.

3.03 PIPING INSTALLATIONS

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicate piping locations and arrangements if such were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Select system components with pressure rating equal to or greater than system operating pressure.
- K. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- L. Install drains, consisting of a tee fitting, NPS 3/4 (DN 20) ball valve, and short NPS 3/4 (DN 20) threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
- M. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- N. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
- O. Install branch connections to mains using [mechanically formed] tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
- P. Install valves according to Division 15 Section "Valves."
- Q. Install unions in piping, NPS 2 (DN 50) and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
- R. Install flanges in piping, NPS 2-1/2 (DN 65) and larger, at final connections of equipment and elsewhere as indicated.

- S. Install strainers on inlet side of each control valve, pressure-reducing valve, solenoid valve, in-line pump, and elsewhere as indicated. Install NPS 3/4 (DN 20) nipple and ball valve in blowdown connection of strainers NPS 2 (DN 50) and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2 (DN 50).

3.04 HANGERS AND SUPPORTS

- A. Piping support must account for expansion and contraction, vibration, dead load of piping and its contents, and seismic-bracing requirements.
- B. Hanger, support, and anchor devices are specified in Division 15 Section "Hangers and Supports." Comply with the following requirements for maximum spacing of supports.
- C. Install the following pipe attachments:
1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet (6 m) long.
 2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet (6 m) or longer.
 3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet (6 m) or longer, supported on a trapeze.
 4. Spring hangers to support vertical runs.
 5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
 6. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.
- D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:
1. NPS 3/4 (DN 20): Maximum span, 7 feet (2.1 m); minimum rod size, 1/4 inch (6.4 mm).
 2. NPS 1 (DN 25): Maximum span, 7 feet (2.1 m); minimum rod size, 1/4 inch (6.4 mm).
 3. NPS 1-1/2 (DN 40): Maximum span, 9 feet (2.7 m); minimum rod size, 3/8 inch (10 mm).
 4. NPS 2 (DN 50): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (10 mm).
 5. NPS 2-1/2 (DN 65): Maximum span, 11 feet (3.4 m); minimum rod size, 3/8 inch (10 mm).
 6. NPS 3 (DN 80): Maximum span, 12 feet (3.7 m); minimum rod size, 3/8 inch (10 mm).
 7. NPS 4 (DN 100): Maximum span, 14 feet (4.3 m); minimum rod size, 1/2 inch (13 mm).
 8. NPS 6 (DN 150): Maximum span, 17 feet (5.2 m); minimum rod size, 1/2 inch (13 mm).
 9. NPS 8 (DN 200): Maximum span, 19 feet (5.8 m); minimum rod size, 5/8 inch (16 mm).
 10. NPS 10 (DN 250): Maximum span, 20 feet (6.1 m); minimum rod size, 3/4 inch (19 mm).
 11. NPS 12 (DN 300): Maximum span, 23 feet (7 m); minimum rod size, 7/8 inch (22 mm).

12. NPS 14 (DN 350): Maximum span, 25 feet (7.6 m); minimum rod size, 1 inch (25 mm).
 13. NPS 16 (DN 400): Maximum span, 27 feet (8.2 m); minimum rod size, 1 inch (25 mm).
 14. NPS 18 (DN 450): Maximum span, 28 feet (8.5 m); minimum rod size, 1-1/4 inches (32 mm).
 15. NPS 20 (DN 500): Maximum span, 30 feet (9.1 m); minimum rod size, 1-1/4 inches (32 mm).
- E. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:
1. NPS 3/4 (DN 20): Maximum span, 5 feet (1.5 m); minimum rod size, 1/4 inch (6.4 mm).
 2. NPS 1 (DN 25): Maximum span, 6 feet (1.8 m); minimum rod size, 1/4 inch (6.4 mm).
 3. NPS 1-1/2 (DN 40): Maximum span, 8 feet (2.4 m); minimum rod size, 3/8 inch (10 mm).
 4. NPS 2 (DN 50): Maximum span, 8 feet (2.4 m); minimum rod size, 3/8 inch (10 mm).
 5. NPS 2-1/2 (DN 65): Maximum span, 9 feet (2.7 m); minimum rod size, 3/8 inch (10 mm).
 6. NPS 3 (DN 80): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (10 mm).
- F. Plastic Piping Hanger Spacing: Space hangers according to pipe manufacturer's written instructions for service conditions. Avoid point loading. Space and install hangers with the fewest practical rigid anchor points.
- G. Fiberglass Piping Hanger Spacing: Space hangers according to pipe manufacturer's written instructions for service conditions. Avoid point loading. Space and install hangers with the fewest practical rigid anchor points.
- H. Support vertical runs at roof, at each floor, and at 10-foot (3-m) intervals between floors.

3.05 PIPE JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 15 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
 - H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
 - I. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
 3. PVC Pressure Piping: Join ASTM D 1785 schedule number, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule number PVC pipe and socket fittings according to ASTM D 2855.
 4. PVC Nonpressure Piping: Join according to ASTM D 2855.
 - J. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.
 - K. Retain paragraph below for grooved-end pipe couplings for copper or steel pipe.
 - L. Grooved Joints: Assemble joints with coupling and gasket, lubricant, and bolts. Cut or roll grooves in ends of pipe based on pipe and coupling manufacturer's written instructions for pipe wall thickness. Use grooved-end fittings and rigid, grooved-end-pipe couplings.
 - M. Retain paragraph below for mechanically formed outlets in place of tee fittings in copper pipe.
 - N. Mechanically Formed, Copper-Tube-Outlet Joints: Use manufacturer-recommended tool and procedure, and brazed joints.
 - O. Pressure-Sealed Joints: Use manufacturer-recommended tool and procedure. Leave insertion marks on pipe after assembly.

3.06 HYDRONIC SPECIALTIES INSTALLATION

- A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.
- B. Install automatic air vents at high points of system piping in mechanical equipment rooms only. Manual vents at heat-transfer coils and elsewhere as required for air venting.
- C. Install piping from boiler air outlet, air separator, or air purger to expansion tank with a 2 percent upward slope toward tank.
- D. Install in-line air separators in pump suction. Install drain valve on air separators NPS 2 (DN 50) and larger.
- E. Install tangential air separator in pump suction. Install blowdown piping with gate or full-port ball valve; extend full size to nearest floor drain.

- F. Install bypass chemical feeders in each hydronic system where indicated, in upright position with top of funnel not more than 48 inches (1200 mm) above the floor. Install feeder in minimum NPS 3/4 (DN 20) bypass line, from main with full-size, full-port, ball valve in the main between bypass connections. Install NPS 3/4 (DN 20) pipe from chemical feeder drain, to nearest equipment drain and include a full-size, full-port, ball valve.
- G. Install expansion tanks above the air separator. Install tank fitting in tank bottom and charge tank. Use manual vent for initial fill to establish proper water level in tank.
 - 1. Install tank fittings that are shipped loose.
 - 2. Support tank from floor or structure above with sufficient strength to carry weight of tank, piping connections, fittings, plus tank full of water. Do not overload building components and structural members.
- H. Install expansion tanks on the floor. Vent and purge air from hydronic system, and ensure tank is properly charged with air to suit system Project requirements.

3.07 TERMINAL EQUIPMENT CONNECTIONS

- A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.
- B. Install control valves in accessible locations close to connected equipment.
- C. Install bypass piping with globe valve around control valve. If parallel control valves are installed, only one bypass is required.
- D. Install ports for pressure gages and thermometers at coil inlet and outlet connections according to Division 15 Section "Gages and Meters."

3.08 CHEMICAL TREATMENT

- A. Perform an analysis of makeup water to determine type and quantities of chemical treatment needed to keep system free of scale, corrosion, and fouling, and to sustain the following water characteristics:
 - 1. Consult water-treatment specialist and insert, in subparagraphs below, specific values required for Project.
 - 2. pH: 9.0 to 10.5.
 - 3. "P" Alkalinity: 100 to 500 ppm.
 - 4. Boron: 100 to 200 ppm.
 - 5. Chemical Oxygen Demand: Maximum [100 ppm].
 - 6. Corrosion Inhibitor:
 - a. Retain one of first five subparagraphs below.
 - b. Sodium Nitrate: 1000 to 1500 ppm.
 - c. Molybdate: 200 to 300 ppm.
 - d. Chromate: 200 to 300 ppm.
 - e. Sodium Nitrate Plus Molybdate: 100 to 200 ppm each.

- f. Chromate Plus Molybdate: 50 to 100 ppm each.
- 7. Soluble Copper: Maximum 0.20 ppm.
- 8. Tolyriazole Copper and Yellow Metal Corrosion Inhibitor: Minimum 10 ppm.
- 9. Total Suspended Solids: Maximum 10 ppm.
- 10. Ammonia: Maximum 20 ppm.
- 11. Free Caustic Alkalinity: Maximum 20 ppm.
- 12. Microbiological Limits:
 - a. Total Aerobic Plate Count: Maximum 1000 organisms/ml.
 - b. Total Anaerobic Plate Count: Maximum 100 organisms/ml.
 - c. Nitrate Reducers: 100 organisms/ml.
 - d. Sulfate Reducers: Maximum 0 organisms/ml.
 - e. Iron Bacteria: Maximum 0 organisms/ml.
- B. Fill system with fresh water and add liquid alkaline compound with emulsifying agents and detergents to remove grease and petroleum products from piping. Circulate solution for a minimum of 24 hours, drain, clean strainer screens, and refill with fresh water.
- C. Add initial chemical treatment and maintain water quality in ranges noted above for the first year of operation.

3.09 FIELD QUALITY CONTROL

- A. Prepare hydronic piping according to ASME B31.9 and as follows:
 - 1. Leave joints, including welds, uninsulated and exposed for examination during test.
 - 2. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
 - 3. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
 - 4. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
 - 5. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.
- B. Perform the following tests on hydronic piping:
 - 1. Procedures in subparagraphs below are paraphrased from ASME B31.9.
 - 2. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.

3. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
 4. Isolate expansion tanks and determine that hydronic system is full of water.
 5. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
 6. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
 7. Prepare written report of testing.
- C. Perform the following before operating the system:
1. Open manual valves fully.
 2. Inspect pumps for proper rotation.
 3. Set makeup pressure-reducing valves for required system pressure.
 4. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
 5. Set temperature controls so all coils are calling for full flow.
 6. Inspect and set operating temperatures of hydronic equipment, such as boilers, chillers, cooling towers, to specified values.
 7. Verify lubrication of motors and bearings.

END OF SECTION 15181

SECTION 15245

VIBRATION ISOLATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Inertia bases.
- B. Vibration isolation.

1.02 RELATED SECTIONS

- A. Cast-in-Place Concrete.
- B. Section 15121 - Piping Expansion Compensation.
- C. Section 15140 - Supports and Anchors.
- D. Equipment Wiring Systems: Electrical characteristics and wiring connections.

1.03 PERFORMANCE REQUIREMENTS

- A. Provide vibration isolation on motor driven equipment over 0.5 HP plus connected piping and ductwork.
- B. Provide minimum static deflection of isolators for equipment as indicated.
 - 1. Basement, Under 20 hp, 1" deflection.
 - 2. Basement, Over 20 hp, 2" deflection.
 - 3. Upper Floors, 2" deflection.
 - 4. Use concrete inertia bases for fans having static pressure in excess of 3.5 inch WC or motors in excess of 40 HP (30 kW), and on base mounted pumps over 10 HP.

1.04 SUBMITTALS

- A. Submit under provisions of General Conditions.
- B. Shop Drawings: Indicate inertia bases and locate vibration isolators, with static and dynamic load on each.
- C. Product Data: Provide schedule of vibration isolator type with location and load on each.
- D. Manufacturer's Installation Instructions: Indicate special procedures and setting dimensions.
- E. Manufacturer's Certificate: Certify that isolators are properly installed and adjusted to meet or exceed specified requirements.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of General Conditions.
- B. Record actual locations of hangers including attachment points.

PART 2 - PRODUCTS

2.01 INERTIA BASES

- A. Structural Bases:
 - 1. Design: Sufficiently rigid to prevent misalignment or undue stress on machine, and to transmit design loads to isolators and snubbers.
 - 2. Construction: Welded structural steel with gusseted brackets, supporting equipment and motor with motor slide rails.

- B. Concrete Inertia Bases:
 - 1. Mass: Minimum of 1.5 times weight of isolated equipment.
 - 2. Construction: Structured steel channel perimeter frame, with gusseted brackets and anchor bolts, adequately reinforced, concrete filled.
 - 3. Connecting Point: Reinforced to connect isolators and snubbers to base.
 - 4. Concrete: Reinforced 3,000 psi concrete.

2.02 VIBRATION ISOLATORS

- A. Open Spring Isolators:
 - 1. Spring Isolators:
 - a. For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
 - 2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 - 3. Spring Mounts: Provide with levelling devices, minimum 0.25 inch thick neoprene sound pads, and zinc chromate plated hardware.
 - 4. Sound Pads: Size for minimum deflection of 0.05 inch; meet requirements for neoprene pad isolators.
- B. Restrained Spring Isolators:
 - 1. Spring Isolators:
 - a. For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
 - 2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 - 3. Spring Mounts: Provide with leveling devices, minimum 0.25 inch thick neoprene sound pads, and zinc chromate plated hardware.
 - 4. Sound Pads: Size for minimum deflection of 0.05 inch; meet requirements for neoprene pad isolators.
 - 5. Restraint: Provide heavy mounting frame and limit stops.
- C. Closed Spring Isolators:

1. Spring Isolators:
 - a. For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
2. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
3. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum 0.25 inch clearance.

D. Restrained Closed Spring Isolators:

1. Spring Isolators:
 - a. For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
2. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
3. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum 0.25 inch (7 mm) clearance and limit stops.

E. Spring Hanger:

1. Spring Isolators:
 - a. For Exterior and Humid Areas: Provide hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
3. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators.
4. Misalignment: Capable of 20 degree hanger rod misalignment.

F. Neoprene Pad Isolators:

1. Rubber or neoprene waffle pads.
 - a. 30 durometer.
 - b. Minimum 1/2 inch thick.
 - c. Maximum loading 40 psi.

- d. Height of ribs shall not exceed 0.7 times width.
- 2. Configuration: Single layer, 1/2 inch thick waffle pads bonded each side of 1/4 inch thick steel plate.
- G. Rubber Mount or Hanger: Molded rubber designed for 0.5 inches deflection with threaded insert.
- H. Glass Fiber Pads: Neoprene jacketed pre-compressed molded glass fiber.
- I. Seismic Snubbers:
 - 1. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
 - 2. Neoprene Elements: Replaceable, minimum of 0.75 inch thick.
 - 3. Capacity: 4 times load assigned to mount groupings at 0.4 inch deflection.
 - 4. Attachment Points and Fasteners: Capable of withstanding 3 times rated load capacity of seismic snubber.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install isolation for motor driven equipment.
- C. Bases:
 - 1. Set steel bases for one inch clearance between housekeeping pad and base.
 - 2. Set concrete inertia bases for 2 inch clearance between housekeeping pad and base.
 - 3. Adjust equipment level.
- D. Install spring hangers without binding.
- E. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
- F. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
- G. Provide pairs of horizontal limit springs on fans with more than 4 inch static pressure, and on hanger supported, horizontally mounted axial fans.
- H. Provide resiliently mounted equipment, piping, and ductwork with seismic snubbers. Each inertia base shall have minimum of four seismic snubbers located close to isolators. Snubbers shall have clearance between 0.15 inch and 0.25 inch.
- I. Support piping connections to isolated equipment resiliently.
 - 1. Up to 4 Inch Diameter: First three points of support.
 - 2. 5 to 8 Inch Diameter: First four points of support.
 - 3. 10 inch Diameter and Over: First six points of support.

4. Select three hangers closest to vibration source for minimum 1.0 inch static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 1.0 inch static deflection or 1/2 static deflection of isolated equipment.

J. Connect wiring to isolated equipment with flexible hanging loop.

3.02 MANUFACTURER'S FIELD SERVICES

- A. Examine systems under provisions of General Conditions.
- B. Inspect isolated equipment after installation and submit report. Include static deflections.

3.03 PIPE ISOLATION SCHEDULE

| Pipe Size
Inch | Isolated Distance from Equipment |
|-------------------|----------------------------------|
| 1 | 120 diameters |
| 2 | 90 diameters |
| 3 | 80 diameters |
| 4 | 75 diameters |
| 6 | 60 diameters |
| 8 | 60 diameters |
| 10 | 54 diameters |
| 12 | 50 diameters |
| 16 | 45 diameters |
| 24 | 38 diameters |

3.04 EQUIPMENT ISOLATION SCHEDULE

- A. Isolation equipment to be used for applications as directed by isolator manufacturer.

END OF SECTION 15245

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SECTION 15260
PIPING INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Piping insulation.
- B. Jackets and accessories.

1.02 REFERENCES

- A. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM C177 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- C. ASTM C195 - Mineral Fiber Thermal Insulation Cement.
- D. ASTM C335 - Steady-State Heat Transfer Properties of Horizontal Pipe Insulation.
- E. ASTM C449 - Mineral Fiber Hydraulic-setting Thermal Insulating and Finishing Cement.
- F. ASTM C518 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- G. ASTM C533 - Calcium Silicate Block and Pipe Thermal Insulation.
- H. ASTM C534 - Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
- I. ASTM C547 - Mineral Fiber Preformed Pipe Insulation.
- J. ASTM C552 - Cellular Glass Block and Pipe Thermal Insulation.
- K. ASTM C585 - Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
- L. ASTM C921 - Properties of Jacketing Materials for Thermal Insulation.
- M. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
- N. ASTM D1667 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Closed Cell Foam).
- O. ASTM E84 - Surface Burning Characteristics of Building Materials.
- P. ASTM E96 - Water Vapor Transmission of Materials.
- Q. NFPA 255 - Surface Burning Characteristics of Building Materials.
- R. UL 723 - Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

- A. Submit under provisions of General Conditions.

- B. Product Data: Provide product description, list of materials and thickness for each service, and locations.
- C. Manufacturer's Installation Instructions: Indicate procedures which ensure acceptable workmanship and installation standards will be achieved.

1.04 QUALITY ASSURANCE

- A. Materials: Flame spread/smoke developed rating of 25/50 or less in accordance with NFPA 255 and UL 723.

1.05 QUALIFICATIONS

- A. Applicator: Company specializing in performing the work of this section with minimum three years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of General Conditions.
- B. Deliver materials to site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
- C. Store insulation in original wrapping and protect from weather and construction traffic.
- D. Protect insulation against dirt, water, chemical, and mechanical damage.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 – PRODUCTS

2.01 GLASS FIBER

- A. Insulation: ASTM C547; rigid molded, noncombustible.
 - 1. 'K' ('ksi') value: ASTM C335, 0.24 at 75 degrees F.
 - 2. Minimum Service Temperature: -20 -120 degrees.
 - 3. Maximum Service Temperature: 450 degrees F.
 - 4. Maximum Moisture Absorption: 0.2 percent by volume.
- B. Vapor Barrier Jacket
 - 1. ASTM C921, White kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Transmission: ASTM E96; 0.02 perm inches.
 - 3. Secure with self sealing longitudinal laps and butt strips.
 - 4. Secure with outward clinch expanding staples and vapor barrier mastic.
- C. Tie Wire: 18 gage stainless steel with twisted ends on maximum 12 inch centers.

- D. Vapor Barrier Lap Adhesive
 - 1. Compatible with insulation.
- E. Insulating Cement/Mastic
 - 1. ASTM C195; hydraulic setting on mineral wool.
- F. Fibrous Glass Fabric
 - 1. Cloth: Untreated; 9 oz/sq yd (305 g/sq m) weight.
 - 2. Blanket: 1.0 lb/cu ft (16 kg/cu m) density.
- G. Indoor Vapor Barrier Finish
 - 1. Vinyl emulsion type acrylic, compatible with insulation, white color.
- H. Outdoor Vapor Barrier Mastic
 - 1. Vinyl emulsion type acrylic, compatible with insulation, white color.
- I. Insulating Cement
 - 1. ASTM C449.

2.02 CELLULAR GLASS

- A. Insulation: ASTM C552.
 - 1. 'K' value: 0.40 at 75 degrees F.
 - 2. Maximum Water Vapor Transmission: 0.1 perm.

2.03 EXPANDED POLYSTYRENE

- A. Insulation: ASTM C578; rigid closed cell.
 - 1. 'K' value: 0.23 at 75 degrees F.
 - 2. Maximum service temperature: 180 degrees F.
 - 3. Maximum Water Vapor Transmission: 0.1 perm.

2.04 HYDROUS CALCIUM SILICATE

- A. Insulation: ASTM C533; rigid molded white; asbestos free.
 - 1. 'K' ('ksi') value: ASTM C177 and C518; 0.44 at 300 degrees F (0.060 at 147 degrees C).
 - 2. Maximum Service Temperature: 1500 degrees F.
 - 3. Density: 13 lb/cu ft.
 - 4. Tie Wire: 18 gage stainless steel with twisted ends on maximum 12 inch (300 mm) centers.
- B. Insulating Cement
 - 1. ASTM C449.

2.05 JACKETS

A. PVC Plastic

1. Jacket: ASTM C921, One piece molded type fitting covers and sheet material, off white color.
 - a. Minimum Service Temperature: -40 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Transmission: ASTM E96; 0.002 perm inches.
 - d. Maximum Flame Spread: ASTM E84; 25.
 - e. Maximum Smoke Developed: ASTM E84; 50, 100.
 - f. Thickness: 20 mil.
 - g. Connections: Brush on welding adhesive and tacks.
2. Covering Adhesive Mastic
 - a. Compatible with insulation.

B. ABS Plastic

1. Jacket: One piece molded type fitting covers and sheet material, off white color.
 - a. Minimum Service Temperature: -40 degrees F.
 - b. Maximum Service Temperature of 180 degrees.
 - c. Moisture Vapor Transmission: ASTM E96; 0.012 perm inches.
 - d. Thickness: 30 mil.
 - e. Connections: Brush on welding adhesive.

C. Canvas Jacket: UL listed

1. Fabric: ASTM C921, 6 oz/sq yd, plain weave cotton treated with dilute fire retardant lagging adhesive.
2. Lagging Adhesive
 - a. Compatible with insulation.

D. Aluminum Jacket: ASTM B209.

1. Thickness: 0.025 inch.
2. Finish: Embossed.
3. Joining: Longitudinal slip joints and 2 inch laps.
4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch.

E. Stainless Steel Jacket: Type 304 stainless steel.

1. Thickness: 0.010, 0.016, 0.018. inch.

2. Finish: Corrugated..
3. Metal Jacket Bands: 3/8 inch wide; inch thick stainless steel.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. On exposed piping, locate insulation and cover seams in least visible locations.
- C. For insulated pipes conveying fluids above ambient temperature:
 1. Provide standard jackets, with or without vapor barrier, factory applied or field applied.
 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe.
 3. Finish with glass cloth and adhesive.
 4. PVC fitting covers may be used.
 5. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
- D. Inserts and Shields:
 1. Application: Piping 1-1/2 inches diameter or larger.
 2. Shields: Steel between pipe hangers or pipe hanger rolls and inserts.
 3. Insert Location: Between support shield and piping and under the finish jacket.
 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 5. Insert Material: hydrous calcium silicate insulation.
- E. Finish insulation at supports, protrusions, and interruptions.
- F. For pipe exposed in mechanical equipment rooms or in finished spaces below 10 feet above finished floor, finish with canvas jacket sized for finish painting.
- G. For exterior applications, provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum or stainless steel jacket with seams located on bottom side of horizontal piping.
- H. For heat traced piping, insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum or stainless steel jacket with seams located on bottom side of horizontal piping.

3.03 TOLERANCE

- A. Substituted insulation materials shall provide thermal resistance within 10 percent at normal conditions, as materials indicated.

3.04 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 - 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Below-Grade Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 - 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.
- F. Insulation Installation at Floor Penetrations:
 - 1. Duct: Install insulation continuously through floor penetrations that are not fire rated. For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
 - 2. Pipe: Install insulation continuously through floor penetrations.

3.05 GLASS FIBER INSULATION SCHEDULE

PIPING SYSTEMS

| | |
|-----------|-----------|
| PIPE SIZE | THICKNESS |
| Inch | Inch |

A. Heating Systems

Heating Water Supply and Return

All

1-1/2"

3.06 COOLING SYSTEMS

PIPING SYSTEMS

PIPE SIZE

THICKNESS

Inch

Inch

A. Cold Condensate Drains

All

1"

3.07 INSULATION SCHEDULE

A.

Service

Minimum Thickness

All hot water mains and branches up to and including 3 inch pipe. Over 3 inch 1-1/2 inch insulation.

1 inch

Horizontal Hot water branches in pipe spaces and vertical drops in partitions.

1/2 inch

1/2 inch

All hot water mains, risers, and branches, below 1-1/2" pipe size provided with heat maintenance cable (HWAT).

1-1/2 inch

All hot water mains, risers and branches, 1-1/2" and larger provided with heat maintenance cable (HWAT).

2 inches

3.08 RIGID INSERT SCHEDULE

Pipe Size

Length

1-1/2" to 2-1/2"

10"

3" to 6"

12"

8" to 10"

16"

12" & Over

22"

3.09 INSTALLATION

A. Install insulation as indicated, in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that installation complies with requirements and serves intended purpose.

- B. Coordinate with other work, as necessary to interface installation of insulation with other work.
- C. Install insulation on pipe system subsequent to installation of heat tracing, testing and acceptance of tests.
- D. Clean and dry pipe surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.
- E. Cover valves, fittings and similar item in each piping system with equivalent thickness and composition of insulation as applied to adjoining pipe run. Install factory molded, precut or job fabricated units except where documents call for insulation to be another type.
- F. Install insulation materials with smooth and even surfaces. Install each continuous run of piping with full length units of insulation with single cut piece to complete run. Do not use cut pieces or scraps abutting each other. Install pipe hanger insulation at all hangers of equal thickness to adjacent insulation. Install insulation protection shields at each pipe hanger between jacket and hanger. Install rigid pipe insulation inserts on all pipes passing through floor sleeves and through fire rated walls and fire rated partition or ceiling openings in order to maintain required fire rated composite for sleeve caulking. In lieu of this requirement, insulation may be deleted from hot pipes below 160°F at the point where they pass through the building's construction.
- G. Install all-purpose insulation jackets over all hot pipe insulation. Install a continuous unbroken vapor barrier seal over all cold pipe insulation to prevent condensation on cold pipes and hangers, supports, anchors, etc., which are secured directly to cold pipes. For hot pipes, apply 3" wide vapor barrier type 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 type.
- H. Do not use staples for jackets on insulation for cold piping.

END OF SECTION 15260

SECTION 15290

DUCTWORK INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Ductwork insulation.
- B. Duct Liner.
- C. Insulation jackets.

1.02 RELATED SECTIONS

- A. Section 15190 - Mechanical Identification.

1.03 REFERENCES

- A. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM C518 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ASTM C553 - Mineral Fiber Blanket and Felt Insulation.
- D. ASTM C612 - Mineral Fiber Block and Board Thermal Insulation.
- E. ASTM E84 - Surface Burning Characteristics of Building Materials.
- F. ASTM E96 - Water Vapor Transmission of Materials.
- G. NFPA 255 - Surface Burning Characteristics of Building Materials.
- H. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- I. UL 723 - Surface Burning Characteristics of Building Materials.

1.04 SUBMITTALS

- A. Submit under provisions of General Conditions.
- B. Product Data: Provide product description, list of materials and thickness for each service, and locations.
- C. Manufacturer's Installation Instructions: Indicate procedures which ensure acceptable workmanship and installation standards will be achieved.

1.05 QUALITY ASSURANCE

- A. Materials: Flame spread/smoke developed rating of 25/50 in accordance with NFPA 255 and UL 723.

1.06 QUALIFICATIONS

- A. Applicator: Company specializing in performing the work of this section with minimum three years experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of General Conditions.

- B. Deliver materials to site in original factory packaging, labeled with manufacturer's density and thickness.
- C. Store insulation in original wrapping and protect from weather and construction traffic.
- D. Protect insulation against dirt, water, chemical, and mechanical damage.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 - PRODUCTS

2.01 GLASS FIBER, FLEXIBLE

- A. Insulation: Flexible, noncombustible blanket.
 - 1. 'K' value : ASTM C518, 0.31 at 75 degrees F.
 - 2. Maximum service temperature: 350 degrees F.
 - 3. Maximum moisture absorption: 0.20 percent by volume.
 - 4. Density: 2.0 lb/cu ft.
- B. Vapor Barrier Jacket
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture vapor transmission: ASTM E96; 0.04 perm.
 - 3. Secure with pressure sensitive tape.
- C. Vapor Barrier Tape
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- D. Tie Wire: Annealed steel, 16 gage.

2.02 GLASS FIBER, RIGID

- A. Insulation: ASTM C612; rigid, noncombustible blanket.
 - 1. 'K' value : ASTM C518, 0.29 at 75 degrees F.
 - 2. Maximum service temperature: 350 degrees F.
 - 3. Maximum moisture absorption: 0.20 percent by volume.
 - 4. Density: 2.0 lb/cu ft.
- B. Vapor Barrier Jacket
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture vapor transmission: ASTM E96; 0.04, 1.3 perm.
 - 3. Secure with pressure sensitive tape.

C. Vapor Barrier Tape

1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

2.03 HYDROUS CALCIUM SILICATE

A. Insulation: ASTM C533; rigid molded white; asbestos free.

1. 'K' ('ksi') value: ASTM C177 and C518; 0.44 at 300 degrees F.
2. Maximum Service Temperature: 1500 degrees F.
3. Density: 13 lb/cu ft.

B. Tie Wire: 18 gage stainless steel with twisted ends on maximum 12 inch (300 mm) centers.

C. Insulating Cement

1. ASTM C449.

2.04 JACKETS

A. Canvas Jacket: UL listed

1. Fabric: 6 oz/sq yd, plain weave cotton treated with dilute fire retardant lagging adhesive.
2. Lagging Adhesive
 - a. Compatible with insulation.

B. Outdoor Jacket: Asphalt impregnated and coated mineral fiber sheet, 36 lb/square.

C. Aluminum Jacket: ASTM B209

1. Thickness: 0.020 inch.
2. Finish: Embossed.
3. Joining: Longitudinal slip joints and 2 inch laps.
4. Fittings: 0.016 inch die shaped fitting covers with factory attached protective liner.
5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum. 0.010 inch thick stainless steel.

2.05 GLASS FIBER DUCT LINER, RIGID

A. Insulation: ASTM C612; semi-rigid, noncombustible.

1. 'K' ('Ksi') value: ASTM C518, 0.23 at 75 degrees F.
2. Maximum service temperature: 250 degrees F.
3. Density: 3.0 lb/cu ft.
4. Maximum Velocity on Coated Air Side: 4,000 ft/min.

B. Adhesive

1. Waterproof fire-retardant type.

- C. Liner Fasteners: Galvanized steel, welded with integral head.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that ductwork has been tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. Insulated ductwork conveying air below ambient temperature:
 - 1. Provide insulation with vapor barrier jackets.
 - 2. Finish with tape and vapor barrier jacket.
 - 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 - 4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- C. Insulated ductwork conveying air above ambient temperature:
 - 1. Provide with or without standard vapor barrier jacket.
 - 2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.
- D. For ductwork exposed in mechanical equipment rooms or in finished spaces above finished floor, finish with canvas jacket sized for finish painting.
- E. For exterior applications, provide insulation with vapour barrier jacket. Cover with outdoor jacket finished as specified in Section 2.3.
- F. External Duct Insulation Application:
 - 1. Secure insulation with vapour barrier with wires and seal jacket joints with vapour barrier adhesive or tape to match jacket.
 - 2. Secure insulation without vapour barrier with staples, tape, or wires.
 - 3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
 - 4. Seal vapour barrier penetrations by mechanical fasteners with vapour barrier adhesive.
 - 5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.
- G. Duct and Plenum Liner Application:
 - 1. Adhere insulation with adhesive for 100 percent coverage.
 - 2. Secure insulation with mechanical liner fasteners. Refer to SMACNA Standards for spacing.
 - 3. Seal and smooth joints.

4. Seal liner surface penetrations with adhesive.
5. Duct dimensions indicated are net inside dimensions required for air flow. Increase duct size to allow for insulation thickness.

3.03 TOLERANCE

- A. Substituted insulation materials shall provide thermal resistance within 10 percent at normal conditions, as materials indicated.

3.04 FLEXIBLE GLASS FIBER DUCTWORK INSULATION SCHEDULE

| DUCTWORK | THICKNESS (Inch) |
|---|------------------|
| Exhaust Ducts Within
10 ft of
Exterior Openings | 1-1/2" |
| Exhaust Ducts Exposed
to Outdoor Air | 1-1/2" |
| Outside Air Intake Ducts | 1-1/2" |
| Plenums | 1" |
| Ventilation Equipment Casings | 1-1/2" |
| Supply Ducts | 1-1/2" |
| Ducts before and after fans, 15'-0" | 1" Lined |
| Ducts Exposed to Outdoors | 3" |

3.05 RIGID GLASS FIBER DUCTWORK INSULATION SCHEDULE

Outside air plenum.

3.06 RIGID GLASS FIBER DUCT LINER INSULATION SCHEDULE

15 feet from intake or discharge of fans.

END OF SECTION 15290

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SECTION 15530
REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

- A. This Section includes refrigerant piping used for air-conditioning applications, including pipes, tubing, fittings, and specialties; special-duty valves; and refrigerants.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 7 Section "Roof Accessories" for roof curbs, piping supports, and roof penetration boots.
 2. Division 7 Section "Joint Sealers" for materials and methods for sealing pipe penetrations through basement walls and fire/smoke barriers.
 3. Division 15 Section "Piping Insulation" for pipe insulation.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and General Conditions.
- B. Product Data for each valve type and refrigerant piping specialty specified.
- C. Shop Drawings showing layout of refrigerant piping, specialties, and fittings, including pipe and tube sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, wall and floor penetrations, and equipment connection details. Show interface and spatial relationship between piping and equipment.
1. Refrigerant piping indicated is schematic only. Size and design the layout and installation of the piping, including oil traps, double risers, specialties, and pipe and tube sizes, to ensure proper operation and conformance with warranties of connected equipment.
- D. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience.
- E. Maintenance data for refrigerant valves and piping specialties to include in the operation and maintenance manual specified in General Conditions Sections and Division 15 Section "Basic Mechanical Requirements."

1.4 QUALITY ASSURANCE

- A. ASME Compliance: Qualify brazing and welding processes and operators according to ASME Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualifications."
- B. Regulatory Requirements: Comply with provisions of the following codes:
 - 1. ASME B31.5, "Refrigeration Piping."
 - 2. ASHRAE 15, "Safety Code for Mechanical Refrigeration."
- C. UL Standard: Provide products complying with UL 207, "Refrigerant-Containing Components and Accessories, Nonelectrical"; or UL 429, "Electrically Operated Valves."
- D. Listing and Labeling: Provide products specified in this Section that are UL listed and labeled.

1.5 SEQUENCING AND SCHEDULING

- A. Coordinate the installation of roof curbs, equipment supports, and roof penetrations. Roof specialties are specified in Division 7 Sections.

1.6 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Refrigeration Oil Test Kits: 2 each, containing everything required to conduct 1 test.
 - 2. Refrigerant: 2 containers each, with 20 lb (9 kg) of refrigerant.
 - 3. Filter-Dryer Cartridges: 3 of each type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Refrigerants:
 - a. Allied Signal Inc.; Genetron Refrigerants.
 - b. DuPont Company; Fluorochemicals Div.
 - c. Elf Atochem North America, Inc.
 - d. ICI Americas Inc.; Fluorochemicals Bus.
 - 2. Refrigerant Valves and Specialties:

- a. Danfoss Electronics, Inc.
- b. Eaton Corporation; Industrial Control Div.
- c. Emerson Electric Company; Alco Controls Div.
- d. Henry Valve Company.
- e. Parker-Hannifin Corp.; Refrigeration & Air Conditioning Division.
- f. Sporlan Valve Company.

2.2 PIPES AND TUBES

- A. Hard Copper Tube: ASTM B 280, Type ACR, drawn temper.
- B. Hard Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B), drawn temper.
- C. Soft Copper Tube: ASTM B 280, Type ACR, annealed temper.
- D. Soft Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B), annealed temper.
- E. Soft Copper Tube: ASTM B 88, Type K (ASTM B 88M, Type A), annealed temper.
- F. Steel Pipe: ASTM A 53, Schedule 40, seamless, black steel.

2.3 PIPE AND TUBE FITTINGS

- A. Copper Fittings: ASME B16.22, wrought-copper streamlined pattern.
- B. Steel Fittings: ASTM A 234 (ASTM A 234M), seamless or welded, for welded joints.
- C. Steel Flanges and Flanged Fittings: ASME B16.5, steel; including bolts, nuts, and gaskets, butt-welded end connection, and raised face.

2.4 JOINING MATERIALS

- A. Brazing Filler Metals: AWS A5.8, Classification BAg-1 (Silver).
- B. Steel Flange Gasket Material: Thickness and material suitable for refrigerant, and design temperatures and pressures.
- C. Welding Materials: Comply with ASME Boiler and Pressure Vessel Code Section II, Part C, for welding materials appropriate for pipe being welded.

2.5 VALVES

- A. Diaphragm Packless Valves: 500-psig (3450-kPa) working pressure and 275 deg F (135 deg C) working temperature, globe or angle pattern, forged-brass or bronze body and bonnet, phosphor bronze and stainless-steel diaphragms, rising stem and handwheel, stainless-steel spring, nylon seat disc, with solder-end connections.

- B. Packed-Angle Valves: 500-psig (3450-kPa) working pressure and 275 deg F (135 deg C) working temperature, forged-brass or bronze body, forged-brass seal caps with copper gasket, back seating, rising stem and seat, molded stem packing, with solder-end connections.
- C. Check Valves--Smaller than 1-Inch NPS (DN25): 500-psig (3450-kPa) operating pressure, 300 deg F (149 deg C) operating temperature; cast-brass body, with removable piston, PTFE seat, and stainless-steel spring; straight-through globe design. Valve shall be straight-through pattern, with solder-end connections.
- D. Check Valves--Larger than 1-Inch NPS (DN25): 450-psig (3100-kPa) operating pressure, 300 deg F (149 deg C) operating temperature; cast-bronze body, with cast-bronze or forged-brass bolted bonnet; floating piston with mechanically retained PTFE seat disc. Valve shall be straight-through or angle pattern, with solder-end connections.
- E. Service Valves: 500-psig (3450-kPa) pressure rating, forged-brass body with copper stubs, brass caps, removable valve core, integral ball check valve, with solder-end connections.
- F. Solenoid Valves: Conform to ARI 760; 250 deg F (121 deg C) temperature rating, 400-psig (2760-kPa) working pressure; forged brass, with PTFE valve seat, 2-way straight-through pattern, and solder-end connections; manual operator; with NEMA 250, Type 1 solenoid enclosure with 1/2-inch (13-mm) conduit adapter, and 24-V normally closed holding coil.
- G. Pressure-Regulating Valves: Conform to ARI 770; pilot operated, forged brass or cast bronze with pilot operator, stainless-steel bottom spring, pressure-gage tappings, 24-V dc standard coil, and wrought-copper fittings for solder-end connections.
- H. Pressure-Regulating Valves: Conform to ARI 770; direct acting, brass with pilot operator, stainless-steel diaphragm, standard coil, and solder-end connections.
- I. Pressure Relief Valves: Straight or angle brass body and disc, neoprene seat, factory sealed and ASME labeled, for standard pressure setting.
- J. Thermal Expansion Valves: Conform to ARI 750; thermostatic-adjustable, modulating type; size as required and factory set for superheat requirements; solder-end connections; with sensing bulb, distributor having side connection for hot-gas bypass line, and external equalizer line.
- K. Hot-Gas Bypass Valve: Adjustable, sized for capacity equal to last step of compressor unloading; solder-end connections.

2.6 REFRIGERANT PIPING SPECIALTIES

- A. Straight- or Angle-Type Strainers: 430-psig (2960-kPa) working pressure; forged-brass or steel body with stainless-steel wire or brass-reinforced Monel screen, and screwed cleanout plug, with solder-end connections.
- B. Straight, Non-Cleanable-Type Strainers: 500-psig (3450-kPa) working pressure; steel shell with stainless-steel screen, with solder-end connections.

- C. Moisture/Liquid Indicators: 500-psig (3450-kPa) operating pressure, 200 deg F (93 deg C) operating temperature; forged-brass body, with replaceable, polished, optical viewing window with color-coded moisture indicator, and solder-end connections.
- D. Replaceable-Core Filter-Dryers: 500-psig (3450-kPa) operating pressure; steel shell, flange ring, and spring, ductile-iron cover plate with steel cap screws, and wrought-copper fittings for solder-end connections; with replaceable-core kit, including gaskets, as follows:
 - 1. Filter Cartridge: Pleated media with integral end rings, stainless-steel support, ARI 730 rated for capacity.
 - 2. Filter-Dryer Cartridge: Pleated media with solid-core sieve with activated alumina, ARI 730 rated for capacity.
 - 3. Wax Removal Cartridge: Molded, bonded core of activated charcoal and desiccant with integral gaskets.
- E. Permanent Filter-Dryer: 350-psig (2140-kPa) maximum operating pressure, 225 deg F (107 deg C) maximum operating temperature; steel shell, and wrought-copper fittings for solder-end connections; molded-felt core surrounded by desiccant.
- F. Flanged Unions: 400-psig (2760-kPa) working pressure, 330 deg F (165 deg C) maximum operating temperature; 2 brass tailpiece adapters for solder-end connections to copper tubing; forged-steel flanges for 1- to 1-1/2-inch (22- to 41-mm) nominal copper-tube size and ductile iron for 2- to 3-inch (54- to 79-mm) nominal copper-tube size with 4 plated steel bolts, with silicon bronze nuts and fiber gasket; factory-applied rust-resistant coating on flanges and bolts.
- G. Flexible Connectors: 500-psig (3450-kPa) operating pressure; seamless tin-bronze or stainless-steel core, high-tensile bronze-braid covering, solder-end connections, and synthetic covering; dehydrated, pressure tested, minimum 7 inches (180 mm) long.
- H. Mufflers: 500-psig (3450-kPa) operating pressure, brazed-steel construction with fusible plug, sized for refrigeration capacity.

2.7 RECEIVERS

- A. 6-Inch (150-mm) Diameter and Smaller: ARI 495, UL listed, steel, brazed; 400-psig (2760-kPa) pressure rating, with tappings for inlet, outlet, and pressure relief valve.
- B. More than 6-Inch (150-mm) Diameter: ARI 495, welded steel, tested and stamped according to ASME Boiler and Pressure Vessel Code, Section 8D; 400 psig (2760 kPa) with tappings for liquid inlet and outlet valves, pressure relief valve, and liquid-level indicator.

2.8 REFRIGERANT

- A. ASHRAE 34, R-123: Dichlorotrifluoroethane.
- B. ASHRAE 34, R-134a: Tetrafluoroethane.
- C. ASHRAE 34, R-22: Monochlorodifluoromethane.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for compliance with requirements for installation tolerances and other conditions affecting performance of refrigerant piping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Aboveground, within Building: Type ACR drawn-copper tubing.
- B. Aboveground, within Building: Type L (Type B) drawn-copper tubing.
- C. Aboveground, within Building: Steel pipe.
- D. Belowground for 2-Inch NPS (DN50) and Smaller: Type L (Type B) annealed-copper tubing.
- E. Belowground for Larger than 2-Inch NPS (DN50): Type K (Type A) annealed-copper tubing.

3.3 INSTALLATION

- A. Install refrigerant piping according to ASHRAE 15.
- B. Basic piping installation requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."
- C. Install piping in short and direct arrangement, with minimum number of joints, elbows, and fittings.
- D. Arrange piping to allow normal inspection and service of compressor and other equipment. Install valves and specialties in accessible locations to allow for service and inspection.
- E. Install piping with adequate clearance between pipe and adjacent walls and hangers, or between pipes for insulation installation. Use sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation.
- F. Belowground, install copper tubing in conduit. Vent conduit outdoors.
- G. Insulate suction lines and liquid lines, but insulate them together if adjacent.
 - 1. Do not install insulation until system testing has been completed and all leaks have been eliminated.
- H. Install branch lines to parallel compressors of equal length, and pipe identically and symmetrically.
- I. Install copper tubing in rigid or flexible conduit in locations where copper tubing will be exposed to mechanical injury.

- J. Slope refrigerant piping as follows:
1. Install horizontal hot-gas discharge piping with a uniform slope of 0.4 percent downward away from compressor.
 2. Install horizontal suction lines with a uniform slope of 0.4 percent downward to compressor.
 3. Install traps and double risers where indicated and where required to entrain oil in vertical runs.
 4. Liquid lines may be installed level.
- K. Use fittings for changes in direction and branch connections.
- L. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.
- M. Reduce pipe sizes using eccentric reducer fittings installed with level side down.
- N. Provide bypass around moisture-liquid indicators in lines larger than 2-inch NPS (DN50).
- O. Install unions to allow removal of solenoid valves, pressure-regulating valves, expansion valves, and at connections to compressors and evaporators.
- P. Install flexible connectors at the inlet and discharge connection, at right angles to axial movement of compressor, parallel to crankshaft.
- Q. Install replaceable-core filter-dryers, with isolation valves and valved bypass.
- R. Install refrigerant valves according to manufacturer's written instructions.
- S. When brazing, remove solenoid-valve coils; remove sight glasses; and remove stems, seats, and packing of valves, and accessible internal parts of refrigerant specialties. Do not apply heat near bulb of expansion valve.
- T. Electrical wiring for solenoid valves is specified in Division 16 Sections. Coordinate electrical requirements and connections.
- U. Mount thermostatic expansion valves in any position, close to evaporator.
1. Where refrigerant distributors are used, mount directly on expansion-valve outlet.
 2. Install valve so diaphragm case is warmer than bulb.
 3. Secure bulb to clean, straight, horizontal section of suction line using 2 bulb straps. Do not mount bulb in a trap or at the bottom of the line.
 4. Where external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.
- V. Install pressure relief valves as required by ASHRAE 15. Pipe pressure relief valves on receivers to outdoors.
- W. Charge and purge systems, after testing, and dispose of refrigerant following ASHRAE 15 procedures.
- X. Charge system as follows:

1. Install filter-dryer core after leak test, but before evacuation.
2. Evacuate refrigerant system with vacuum pump, until temperature of 35 deg F (1.7 deg C) is indicated on vacuum dehydration indicator.
3. Maintain vacuum for a minimum of 5 hours.
4. Break vacuum with refrigerant gas and charge to 2 psig (14 kPa).

3.4 HANGERS AND SUPPORTS

- A. General: Hangers, supports, and anchors are specified in Division 15 Section "Hangers and Supports." Provide according to ASME B31.5 and MSS SP-69.
- B. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet (6 m) in length.
- C. Roller hangers and spring hangers for individual horizontal runs 20 feet (6 m) or longer.
- D. Pipe rollers for multiple horizontal runs, 20 feet (6 m) or longer supported by a trapeze.
- E. Spring hangers to support vertical runs.
- F. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes. Tube sizes are nominal or standard tube sizes as expressed in ASTM B 88 (ASTM B 88M).
 1. 1/2 Inch (15 mm): Maximum span, 60 inches (1500 mm); minimum rod size, 1/4 inch (6.3 mm).
 2. 5/8 Inch (18 mm): Maximum span, 60 inches (1500 mm); minimum rod size, 1/4 inch (6.3 mm).
 3. 1 Inch (28 mm): Maximum span, 60 inches (1500 mm); minimum rod size, 1/4 inch (6.3 mm).
 4. 1-1/4 Inches (35 mm): Maximum span, 72 inches (1800 mm); minimum rod size, 1/4 inch (6.3 mm).
 5. 1-1/2 Inches (42 mm): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).
 6. 2 Inches (54 mm): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).
 7. 2-1/2 Inches (67 mm): Maximum span, 108 inches (2700 mm); minimum rod size, 3/8 inch (9.5 mm).
 8. 3 Inches (79 mm): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (9.5 mm).
 9. 4 Inches (105 mm): Maximum span, 12 feet (3.6 m); minimum rod size, 1/2 inch (12.7 mm).
- G. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:
 1. 1/2-Inch NPS (DN15): Maximum span, 84 inches (2100 mm); minimum rod size, 1/4 inch (6.3 mm).
 2. 3/4-Inch NPS (DN20): Maximum span, 84 inches (2100 mm); minimum rod size, 1/4 inch (6.3 mm).
 3. 1-Inch NPS (DN25): Maximum span, 84 inches (2100 mm); minimum rod size, 1/4 inch (6.3 mm).
 4. 1-1/4-Inch NPS (DN32): Maximum span, 96 inches (2400 mm); minimum rod size, 3/8 inch (9.5 mm).

5. 1-1/2-Inch NPS (DN40): Maximum span, 108 inches (2700 mm); minimum rod size, 3/8 inch (9.5 mm).
6. 2-Inch NPS (DN50): Maximum span, 10 feet (3 m); minimum rod size, 3/8 inch (9.5 mm).
7. 2-1/2-Inch NPS (DN65): Maximum span, 11 feet (3.4 m); minimum rod size, 3/8 inch (9.5 mm).
8. 3-Inch NPS (DN80): Maximum span, 12 feet (3.6 m); minimum rod size, 3/8 inch (9.5 mm).
9. 4-Inch NPS (DN100): Maximum span, 14 feet (4.3 m); minimum rod size, 1/2 inch (12.7 mm).

H. Support vertical runs at each floor.

3.5 PIPE JOINT CONSTRUCTION

- A. Basic pipe and tube joint construction is specified in Division 15 Section "Basic Mechanical Materials and Methods."
- B. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide) during brazing to prevent formation of scale.

3.6 VALVE INSTALLATIONS

- A. Install refrigerant valves according to manufacturer's written instructions.
- B. Install valves on suction and discharge of compressor, for gage taps at compressor inlet and outlet, for gage taps at hot-gas bypass regulators, on inlet and outlet, and on each side of strainers.
- C. Install check valves on compressor discharge and on condenser liquid lines on multiple condenser systems.
- D. Install refrigerant-charging (packed-angle) valve in liquid line between receiver shutoff valve and expansion valve.
- E. Install globe valves on each side of strainers and dryers, in liquid and suction lines at evaporators, and elsewhere as indicated.
- F. Install a full-sized, 3-valve bypass around each dryer.
- G. Install solenoid valves ahead of each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at top.
 1. Electrical wiring for solenoid valves is specified in Division 16 Sections. Coordinate electrical requirements and connections.
- H. Mount thermostatic expansion valves in any position, close to evaporator.
 1. Where refrigerant distributors are used, mount directly on expansion-valve outlet.
 2. Install valve so diaphragm case is warmer than bulb.

3. Secure bulb to clean, straight, horizontal section of suction line using 2 bulb straps. Do not mount bulb in a trap or at the bottom of the line.
 4. Where external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.
- I. Install pressure-regulating and relief valves as required by ASHRAE 15.

3.7 SPECIALTIES APPLICATION AND INSTALLATION

- A. Install liquid indicators in liquid line leaving condenser, in liquid line leaving receiver, and on leaving side of liquid solenoid valves.
- B. Install strainers immediately upstream of each automatic valve, including expansion valves, solenoid valves, hot-gas bypass valves, and compressor suction valves.
- C. Install strainers on main liquid line where multiple expansion valves with integral strainers are used.
- D. Install strainers in suction line of steel pipe.
- E. Install moisture-liquid indicators in liquid lines between filter-dryers and thermostatic expansion valves and in liquid line to receiver.
- F. Install pressure relief valves on ASME receivers, and pipe to outdoors.
- G. Install replaceable-core filter-dryers in vertical liquid line adjacent to receivers and before each solenoid valve.
- H. Install permanent filter-dryers in low-temperature systems, in systems using hermetic compressors, and before each solenoid valve.
- I. Install solenoid valves in liquid line of systems operating with single pump-out or pump-down compressor control, in liquid line of single or multiple evaporator systems, and in oil bleeder lines from flooded evaporators to stop flow of oil and refrigerant into suction line when system shuts down.
- J. Install receivers on systems 5 tons (18 kW) and larger, and on systems with long piping runs, sized to accommodate pump-down charge.
- K. Install flexible connectors at or near compressors where piping configuration does not absorb vibration.

3.8 CONNECTIONS

- A. Electrical: Conform to applicable requirements of Division 16 Sections for electrical connections.

3.9 FIELD QUALITY CONTROL

- A. Inspect and test refrigerant piping according to ASME B31.5, Chapter VI.
 - 1. Pressure test with nitrogen to 200 psig (1380 kPa). Perform final tests at 27-psig (186-kPa) vacuum and 200 psig (1380 kPa) using halide torch or electronic leak detector. Test to no leakage.
- B. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.
- C. Repair leaks using new materials; retest.

3.10 ADJUSTING

- A. Adjust thermostatic expansion valve to obtain proper evaporator superheat requirements.

3.11 CLEANING

- A. Before installation of copper tubing other than Type ACR, clean tubing and fittings with trichloroethylene.

3.12 COMMISSIONING

- A. Charge system using the following procedures:
 - 1. Install core in filter dryer after leak test, but before evacuation.
 - 2. Evacuate refrigerant system with vacuum pump until temperature of 35 deg F (1.67 deg C) is indicated on vacuum dehydration indicator.
 - 3. During evacuation, apply heat to pockets, elbows, and low spots in piping.
 - 4. Maintain vacuum on system for minimum of 5 hours after closing valve between vacuum pump and system.
 - 5. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig (14 kPa).
 - 6. Complete charging of system, using new filter-dryer core in charging line. Provide full-operating charge.

END OF SECTION 15530

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SECTION 15611

ELECTRIC HEATING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Work in this Section includes the providing of labor, materials, equipment and services necessary for a complete and safe installation in accordance with the contract documents and all applicable codes and commissioner having jurisdiction for the following:

1. Cabinet heaters.

1.02 REFERENCED STANDARDS

- A. Published Specifications' standards, tests or recommended methods of trade, industry or governmental organizations apply to work in this Section.
- B. National Electric Code.
- C. Underwriters Laboratories Inc.

1.03 QUALITY ASSURANCE

- A. Equipment, material and installation shall be in accordance with NEC, local codes and shall be UL listed or labeled.

1.04 SUBMITTALS

- A. Submit shop drawings, including catalog cuts, schedules and wiring diagrams for the following:

1. Cabinet Heaters.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Unit heater-cabinet type: Berko Electric, (a Marley Co.), Singer Co., Climate Control Div. and Emerson Environmental Products Div., Emerson Electric Co. (Chromalox).
- B. INDEECO.
- C. Neptronic.
- D. Or Approved Equal.

2.02 FORCED FLOW HEATERS

- E. Cabinet heaters shall be blow thru type, with direct driven double inlet forward curved centrifugal fans, two speed permanent split capacitor motor with overload protection, 16 gauge furniture quality steel internally insulated, inlet and outlet discharge grilles, heating fins, throw-away type filters and as follows:

1. See plans for Mounting Arrangement.
2. Electrical thermostat with capillary tube as follows:
 - a. Remotely mounted by contractor.

- b. Overheat cut out.
 - c. Bulb and capillary type thermostat shall sense temperature along entire length of heating elements. Adjustment range shall be 46 deg to 75 deg F. Thermostat shall factory installed in enclosure terminal box and factory wired to heating element.
 - d. Manual 2-speed switch, fan delay switch and high limit thermal cut-out, automatic reset type, wired to each heating element.
3. Cabinet heater similar to Chromalox Model CU and/or approved equal.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Coordinate with electrical work.
- B. Wiring shall be in conduit and in strict conformance with specifications for Electrical Work.
- C. Install unit heaters on hanger rods or wall brackets as required. Where overhead construction does not permit fastening of rods, provide additional framing.
- D. Provide recessed, semi-recessed and/or free standing cabinet type unit heaters as noted or indicated.
- E. Mount finned tube radiation in accordance with manufacturer's recommendations. Bottom of unit shall be a minimum of 3 inches above finished floor or as indicated on drawings.

END OF SECTION 15611

SECTION 15738

SPLIT SYSTEM AIR-CONDITIONING UNITS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Condensing unit package.
- B. Air-Handling Unit Package.
- C. Charge of refrigerant and oil.
- D. Refrigerant piping connections.
- E. Motor starters.
- F. Electrical power connections.

1.2 RELATED SECTIONS

- A. Section 15530 - Refrigeration Piping and Specialties.
- B. Section 15900 - HVAC Instrumentation and Controls.
- C. Section 15245 - Vibration Isolation

1.3 REFERENCES

- A. ANSI/ASHRAE 15 - Safety Code for Mechanical Refrigeration.
- B. ANSI/ASHRAE/IES 90 A - Energy Conservation in New Building Design Standard.
- C. ARI 210/240 - Unitary Air-Conditioning Equipment and Air-Source Heat Pump Equipment, (units less than 135,000 Btuh).
- D. ARI 360 - Commercial and Industrial Unitary Air Conditioning Equipment testing and rating standard (condensing units greater than 135,000 Btuh).
- E. ARI 340 - Commercial and Industrial Unitary Heat Pump Equipment, (heat pumps greater than 135,000 Btuh).
- F. ANSI Z21.47/UL1995 - Unitary Air Conditioning Standard for safety requirements.
- G. ARI 270 - Sound Rating of Outdoor Unitary Equipment, (units less than 135,00 Btuh).

- H. ARI 370 - Sound Rating of Large Outdoor Refrigerating and Air Conditioning Equipment (equipment above 135,000 Btuh).

1.4 SUBMITTALS

- A. Submit unit performance data including: capacity, nominal and operating performance.
- B. Submit Mechanical Specifications for unit and accessories describing construction, components and options.
- C. Submit shop drawings indicating overall dimensions as well as installation, operation and service clearances. Indicate lift points and recommendations and center of gravity. Indicate unit shipping, installation and operating weights including dimensions.
- D. Submit data on electrical requirements and connection points. Include recommended wire and fuse sizes or MCA, sequence of operation, safety and start-up instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Unit shall be shipped as single package only, and shall be stored and handled according to unit manufacturer's recommendations.

1.6 WARRANTY

- A. Provide parts warranty for one year from start-up or 18 months from shipment, whichever occurs first.

1.7 Maintenance Service

- A. Furnish complete parts and labor service guarantee of packaged roof top units for one year from Date of Substantial Completion by contractor.
- B. Submit copy of service call work order or report and include description of work performed.

1.8 REGULATORY REQUIRMENTS

- A. Unit shall conform to ANSI Z21.47/UL 1995 for construction of packaged air conditioner.
 - 1. In the event the unit is not UL approved, the manufacturer must, at his expense, provide for a field inspection by a UL representative to verify conformance to UL standards. If necessary, contractor shall perform modifications to the unit to comply with UL, as directed by the UL representative, at no additional expense to the City of New York.

1.9 SYSTEM DESCRIPTION

Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a hermetic scroll air-conditioning compressor(s) assembly, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit matched with a packaged air-handling unit.

1.10 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with AHRI Standard 360.
- B. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
- C. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
- D. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
- E. Air-cooled condenser coils for hermetic scroll compressor units 38AUZ and 38AUD shall be leak tested at 150 psig, and pressure tested at 650 psig.
- F. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

PART 2 PRODUCTS

2.1 Commercial Air-Cooled Condensing Unit

A. General:

Factory-assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge, and special features required prior to field start-up.

B. Unit Cabinet:

- 1. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted baked enamel finish.
- 2. A heavy-gauge roll-formed perimeter base rail with forklift slots and lifting holes shall be provided to facilitate rigging.

C. Condenser Fans:

- 1. Condenser fans shall be direct driven, propeller type, discharging air vertically upward.
- 2. Fan blades shall be balanced.
- 3. Condenser fan discharge openings shall be equipped with PVC-coated steel wire safety guards.
- 4. Condenser fan and motor shaft shall be corrosion resistant.

D. Compressor:

- 1. Compressor shall be of the hermetic scroll type.

2. Compressor shall be mounted on rubber grommets.
3. Compressors shall include overload protection.
4. Compressors shall be equipped with a crankcase heater.
5. Compressor shall be equipped with internal high pressure and high temperature protection.
6. 38AUZ*16 and 25 sizes shall use two scroll compressors manifold together. 38AUZD08 and 38AUZE08 shall use one refrigerant circuit with one 2-stage compressor.

E. Condenser Coils:

1. Standard Aluminum fin - Copper Tube Coils:
 - a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
 - b. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
 - c. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

F. Refrigeration Components:

Refrigeration circuit components shall include liquid line service valve, suction line service valve, a full charge of compressor oil, and a partial holding charge of refrigerant.

G. Controls and Safeties:

1. Minimum control functions shall include:
 - a. Control wire terminal blocks.
 - b. Compressor lockout on auto-reset safety until reset from thermostat.
 - c. Each unit shall utilize the Comfort Alert[®] Diagnostic Board that provides:
 - (1.) System Pressure Trip fault code indication
 - (2.) Short Cycling fault code indication
 - (3.) Locked Rotor fault code indication
 - (4.) Open Circuit fault code indication
 - (5.) Reverse Phase 3 fault code indication
 - (6.) Welded Contactor fault code indication
 - (7.) Low Voltage fault code indication
 - (8.) Anti-short cycle protection
 - (9.) Phase reversal protection
2. Minimum safety devices which are equipped with automatic reset (after resetting first at thermostat), shall include:
 - a. High discharge pressure cutout.
 - b. Low pressure cutout.

H. Electrical Requirements:

1. Nominal unit electrical characteristics shall be 208 v, 3-ph, 60 Hz.
2. Unit electrical power shall be single-point connection.
3. Unit control circuit shall contain a 24-v transformer for unit control.

I. Special Features:

1. Low-Ambient Temperature Control:

- a. A low-ambient temperature control shall be available as a factory-installed option or as a field-installed accessory. This low-ambient control shall regulate speed of the condenser-fan motors in response to the saturated condensing temperature of the unit. The control shall maintain correct condensing pressure at outdoor temperatures down to -20°F .

2. Unit-Mounted, Non-Fused Disconnect Switch:

- a. Switch shall be factory-installed and internally mounted. NEC and UL-approved non-fused switch shall provide unit power shutoff. Switch shall be accessible from outside the unit and shall provide power off lockout capability. Non-fused disconnect switch cannot be used when unit MOCP electrical rating exceeds 80 amps.

J. Approved Manufacturers:

1. Carrier (Basis of Design).
2. York.
3. Trane.

2.2 COMMERCIAL PACKAGED AIR-HANDLING UNIT

Indoor mounted, draw-thru, packaged air-handling unit that can be used in a suspended horizontal configuration or a vertical configuration. Unit shall consist of forward-curved belt-driven centrifugal fan(s), motor and drive assembly, pre-wired fan motor contactor, factory-installed refrigerant metering devices (direct-expansion coil units), cooling coil, 2-in. disposable air filters, and condensate drain pans for vertical or horizontal configurations.

A. Base Unit:

1. Cabinet shall be constructed of mill-galvanized steel.
2. Cabinet panels shall be fully insulated with $\frac{1}{2}$ -in. fire-retardant material. Insulation shall contain an EPA-registered immobilized antimicrobial agent to effectively resist the growth of bacteria and fungi as proven by tests in accordance with ASTM standards G21 and 22 (U.S.A.).

3. Unit shall contain non-corroding condensate drain pans for both vertical and horizontal applications. Drain pans shall have connections on right and left sides of unit to facilitate field connection. Drain pans shall have the ability to be sloped toward the right or left side of the unit to prevent standing water from accumulating in pans.
4. Unit shall have factory-supplied 2-in. throwaway-type filters installed upstream from the cooling coil. Filter access shall be from either the right or left side of the unit.

B. Coils:

DX coil is 4-row and consists of copper tubes with sine-wave aluminum fins bonded to the tubes by mechanical expansion. Suction and liquid line connections or supply and discharge connections shall be made on the same side of the coil.

1. Direct-expansion coils shall feature factory installed thermostatic expansion valves (TXVs) for refrigerant control. The TXVs shall be Puron® R-410A compatible and capable of external adjustment. Coil tubing shall be internally rifled to maximize heat transfer. The 40RUAA28 & 30 have EA36UZ031 TXVs. These are Sporlan BBIZE-15-GA-BP5 which have a 5% bleed.
2. Chilled water coils shall be rated for an operating pressure of not less than 300 psig.

C. Operating Characteristics:

1. When combined with matching 38AU condensing unit the system shall be capable of starting and running at ambient outdoor temperatures from 35°F to 125°F in cooling mode and from -10°F to 60°F in heating mode.
2. Unit shall operate at +/- 10% from rated voltage.

D. Motor:

1. Fan motor of the size and electrical characteristics specified on the equipment schedule shall be factory supplied and installed.
2. Motors rated at 1.3 through 3.7 hp shall have inherent thermal overload protection. Motors rated at 5 hp shall be protected by a circuit breaker.
3. Evaporator-fan motor shall have permanently lubricated, sealed bearings and inherent automatic-reset thermal overload protection or manual reset calibrated circuit breakers. Evaporator motors are designed specifically for Carrier and do not have conventional horsepower (hp) ratings listed on the motor nameplate. Motors are designed and qualified in the "air-over" location downstream of the cooling coil and carry a maximum continuous bhp rating that is the maximum application bhp rating for the motor; no "safety factors" above that rating may be applied.

4. All evaporator-fan motors 5 hp and larger shall meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT), effective October 24, 1997.

E. Approved Manufacturers:

1. Carrier (Basis of Design).
2. York.
3. Trane.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Prior to installation, contractor shall perform noise level readings of existing condensers.
- B. Install in accordance with manufacturer's instructions.
- C. Provide for connection to electrical service.
- D. Install units on vibration isolation.
- E. Provide connection to refrigeration piping system and evaporators.
- F. Contractor shall perform noise level readings after installation of equipment.

END OF SECTION 15738

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SECTION 15761
HOT WATER COILS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

- A. This section includes the following:
 - 1. Hot-water coils
- B. Related Sections include the following:
 - 1. Division 15 Section "Gages and Meter" for coil temperature-control valve requirements.

1.03 SUBMITTALS

- A. Product Data: Include rated capacities of selected models; pressure drop; shipping, installed, and operating weights; installation instructions; and startup instructions for each type of product indicated.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring.
- C. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating coil location and ceiling-mounted access panels.
- D. Maintenance Data: For air coils to include in maintenance manuals specified in General Conditions.

1.04 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with ARI 410, "Standard for Forced-Circulation Air-Cooling and Air-Heating Coils," for components, construction, and rating.

1. Certify coils to ARI 410, "Standard for Forced-Circulation Air-Cooling and Air-Heating Coils."

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Water Coils:
 - a. Aerofin Corporation (basis of design).
 - b. Dunham-Bush, Inc.
 - c. Heatcraft Inc.; Heat Transfer Division.

2.02 HOT-WATER COILS

A. Description: Cleanable coil fabricated to ARI 410.

B. Dampers: Arrangement of coil segments with face-and-bypass dampers and downstream damper.

1. Arrangement: Vertical coils.
2. Dampers: Extruded-aluminum blades with full-length drive rod.

C. Piping Connections: Threaded, on same end or Threaded, on opposite ends.

D. Tubes: Copper, complying with ASTM B 75 (ASTM B 75M).

1. Tube Diameter: 0.50 inch (12.7 mm).

E. Tubes: Red brass, complying with ASTM B 111.

1. Tube Diameter: 0.625 inch (15.9 mm).
2. Minimum Tube Thickness: 0.020 inch (0.51 mm).

F. Fins: Aluminum with fin spacing 0.125 inch (3.18 mm).

G. Fin and Tube Joint: Mechanical bond.

H. Headers: Cast iron with cleaning plugs, and drain and air vent tappings.

I. Frames: Galvanized-steel channel frame, 0.064 inch (1.6 mm).

- J. Ratings: Design tested and rated according to ASHRAE 33 and ARI 410.
 - 1. Working Pressure Ratings: 200 psig (1380 kPa), 325 deg F (163 deg C).
- K. Source Quality Control: Test to 300 psig (2070 kPa), and to 200 psig (1380 kPa) underwater.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine ducts, plenums, and units to receive air coils for compliance with requirements for installation tolerances and other conditions affecting coil performance.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before coil installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install coils level and plumb.
- B. Install coils in metal ducts and casings constructed according to SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."

3.03 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to coils to allow service and maintenance.
- C. Unless otherwise indicated, connect piping with unions and shutoff valves to allow coils to be disconnected without draining piping. Refer to piping system Sections for specific valve and specialty arrangements.

3.04 ADJUSTING

- A. Adjust initial temperature and humidity set points.
- B. Set field-adjustable switches and circuit-breaker trip ranges as indicated.
- C. Straighten bent fins on each air coil.

3.05 CLEANING

- A. After completing system installation, including outlet fitting and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes.
- B. Clean coils using materials and methods recommended in writing by manufacturers, and clean inside of casings and enclosures to remove dust and debris.

END OF SECTION 15761

SECTION 15764

CONVECTION HEATING UNITS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Adjust list below to suit Project.
 - 2. Hydronic finned-tube radiators.
 - 3. Hot-Water cabinet unit heater.
 - 4. Hot-water unit heater.

1.03 SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for each type of product indicated.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 1. Details of custom-fabricated enclosures indicating dimensions.
 - 2. Location and size of each field connection.
 - 3. Location and arrangement of piping valves and specialties.
 - 4. Location and arrangement of integral controls.
 - 5. Enclosure joints, corner pieces, access doors, and other accessories.
- C. Coordination Drawings: Floor plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
 - 1. Structural members, including wall construction, to which convection units will be attached.
 - 2. Method of attaching convection units to building structure.
 - 3. Penetrations of fire-rated wall and floor assemblies.
- D. Color Samples for Initial Selection: For units with factory-applied color finishes.
- E. Color Samples for Verification: For each type of exposed finish required.
- F. Field quality-control test reports.
- G. Operation and Maintenance Data: For convection heating units to include in emergency, operation, and maintenance manuals.

1.04 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to underwriters' laboratory, and marked for intended use.

PART 2 - PRODUCTS

2.01 HOT-WATER FINNED-TUBE RADIATORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Vulcan.
 - 2. Modine.
 - 3. Slant/Fin.
 - 4. Or Approved Equal.
- B. Performance Ratings: Rate finned-tube radiators according to Hydronics Institute's "I=B=R Testing and Rating Standard for Finned-Tube (Commercial) Radiation."
- C. Heating Elements: Copper tubing mechanically expanded into flanged collars of evenly spaced aluminum fins resting on element supports. One tube end shall be belled.
 - 1. Average Water Temperature: 170F.
 - 2. Minimum Water Velocity: 3 fps.
- D. Element Supports: Ball-bearing cradle type to permit longitudinal movement on enclosure brackets.
- E. Retain one of first two paragraphs below, or retain both and indicate location of each panel type on Drawings.
- F. Rust-Resistant Front Panel: Minimum 0.052-inch thick, ASTM A 653/A 653M, G60 galvanized steel.
- G. Wall-Mounting Back Panel: Minimum 0.0329-inch thick steel, full height, with full-length channel support for front panel without exposed fasteners.
- H. Support Brackets: Locate at maximum 36-inch spacing to support front panel and element.
- I. Finish: Baked enamel or epoxy finish in manufacturer's custom color as selected by Commissioner.
- J. Access Doors: Factory made, permanently hinged with tamper-resistant fastener, minimum size 6 by 7 inches integral with enclosure.
- K. Enclosure Style: Sloped top.
 - 1. Bottom Inlet Grille: Punched louver; painted to match enclosure.
 - 2. Top Outlet Grille: Punched louver; painted to match enclosure.
- L. Accessories: corners, splice plates all matching the enclosure and grille finishes.

2.02 HOT-WATER CABINET UNIT HEATER

- A. Cabinet:

Floor models shall be provided with stamped louvers and a one inch high dust barrier at the bottom. The cabinet shall be 18-gauge steel with 16 gauge front panels. All painted surfaces shall be

treated for corrosion resistance prior to being finished with a tan, baked on polyester powder coat finish. All unpainted steel shall be galvanized. When specified color as selected by architect shall be provided in one of 8 optional colors as shown on manufacturer's color chart 75-403.

Wall or ceiling models shall have cabinets with stamped louvers. The entire bottom of the unit must be enclosed. Access to the speed control shall be through the easy access 16-gauge front panels.

(Available, when specified, as optional equipment) an access door shall be provided for speed control access.

All models shall have two 9" minimum wide piping end pockets. All wall and ceiling units shall have safety hinged access panels that can be easily removed during installation.

B. Coils:

The heating coils shall provide specified capacities and not exceed the pressure drop and GPM listed in this catalog. Coils shall be suitable for 200 PSI working pressure with 240°F water.

C. Motor Speed Control:

The unit shall have a unit-mounted solid state motor speed control, with high through low speeds and off positions on all models.

D. Motors, Blowers and Drives:

Blowers shall be of the centrifugal, forward curved type, to provide even air distribution and low sound level. All units shall have shaded pole (permanent split capacitor available when specified as optional equipment) direct-drive motors. The motor and blower assembly shall be capable of being easily removed from the unit. Motors are built for continuous duty to NEMA standards.

E. Grilles:

When specified, aluminum linear bar inlet and/or outlet grilles shall be provided. When specified, outlet may have two-way deflection louvers.

F. Filters:

All air, both fresh and return, shall be filtered by a cleanable expanded aluminum filter.

G. Acceptable manufacturers:

Modine

2.03 HOT-WATER UNIT HEATER:

A. Casing:

Two-piece with "picture frame" front formed into wraparound sides, top and bottom. Adjustable horizontal louvers are standard. 18 gauge back panel with deep-draw fan orifice for extreme rigidity. Steel supply and return pipe tap connectors bolted to back. Casings phosphatized to prevent corrosion and painted with blue gray baked enamel.

B. Fan:

Trane designed and built high efficiency Model A fan with aluminum blades is quiet, factory balanced and sturdy for standard or sparkproof applications.

C. Coils:

Hot water headerless coils are single tube, single serpentine on all sizes except 230 thru 354 which have two circuits. Fins are aluminum Sigma-Flo, mechanically bonded to seamless copper tubing.

All coils one-row deep in air flow direction. Coils tested at 400 psi air under water. Standard coils have .031 copper tubing suitable for use on steam pressures to 75 psi or hot water up to 200 psi or 325 F. (When Specified) Heavy .049 red brass tubing suitable for 75 psi steam or 390 deg. F water at 260 psi — .031 cupronickel tubing suitable for 450 deg. F water at 400 psi — .049 steel tubing suitable for 450 deg. F water at 400 psi.

- C. Motors Totally enclosed, 115/60/1 Class "B" insulated shaded pole and PSC motors are STD. 1 / 50 through 1 / 8 hp are sleeve bearing, 1 / 6 through 3 / 4 hp are ball bearing. All single phase motors have built in overload protection. Sleeve bearing motors can be oiled. Ball bearing motors are permanently lubricated. The 115/60/1 motors used as standard on unit sizes 18S through 100S can be operated at multiple speeds with the addition of a solid- state control. All units available with explosion-proof motors. Only sizes 18S, 42S, 90S and 126S are available from stock with 115/60/1 explosion-proof motors.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive convection heating units for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in for hydronic-piping connections to verify actual locations before convection heating unit installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 FINNED-TUBE RADIATOR INSTALLATION

- A. Install units level and plumb.
- B. Install enclosure continuously around corners, using outside and inside corner fittings.
- C. Join sections with splice plates and filler pieces to provide continuous enclosure.
- D. Install access doors for access to valves.
- E. Install enclosure continuously from wall to wall.
- F. Terminate enclosures with manufacturer's end caps, except where enclosures are indicated to extend to adjoining walls.
- G. Install valves within reach of access door provided in enclosure.
- H. Install air-seal gasket between wall and recessing flanges or front cover of fully recessed unit.
- I. Install piping within pedestals for freestanding units.

3.03 CONNECTIONS

- A. Coordinate piping installations and specialty arrangements with schematics on Drawings and with requirements specified in piping systems. If Drawings are explicit enough, these requirements may be reduced or omitted.
- B. Piping installation requirements are specified in Division 15 Section "Hydronic Piping and Pipe Fittings." Drawings indicate general arrangement of piping, fittings, and specialties.
- C. Connect hot-water units and components to piping according to Division 15 Section "Hydronic Piping and Pipe Fittings."
- D. Install shutoff valves on inlet and outlet, and balancing valve on outlet.
- E. Install control valves as required by Division 15 Section "HVAC Instrumentation and Control."

F. Install piping adjacent to convection heating units to allow service and maintenance.

3.04 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace convection heating units that do not pass tests and inspections and retest as specified above.

C. END OF SECTION 15764

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SECTION 15765

RECTANGULAR DUCT BYPASS BOX

PART 1 PRODUCTS

1.1 RECTANGULAR DUCT BYPASS BOX

- A. Furnish and install slide-in duct mount variable air volume retrofit terminals of the sizes and capacities shown on the plans.
- B. The terminal shall be documented with catalog and test data for sound levels and differential static pressure requirements. The test data shall be the result of testing in accordance with industry ARI Standard 880.
- C. The retrofit terminal shall be designed to slide into the side of existing ductwork, with a maximum 10-inch length of duct opening required. Terminal orifice plate shall be undersized ¼-inch for ease of installation. Gasket shall be field installed to assure tight seal. No additional components will be required inside the ductwork for mounting. A flange shall be provided for fastening the terminal to the ductwork with sheet metal screws.
- D. The terminal shall be constructed of minimum 22-gauge galvanized steel. The damper shall be opposed blade type, with airfoil shaped blades constructed of 14-gauge steel or equivalent thickness extruded aluminum. The damper shall have extruded vinyl blade edge seals and flexible metal compressible jamb seals. Leakage of the damper shall not exceed 2 percent of rated flow at 6-inch wg.
- E. Actuators shall be capable of supplying at least 35 inches per pound of torque to the damper shaft and shall be mounted externally for service access.
- F. Approved Manufacturers:
 - 1. Titus (basis of design)
 - 2. Anemostat
 - 3. Nailor

END OF SECTION 15765

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SECTION 15792

ACOUSTICAL TREATMENT

PART 1 - GENERAL

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.01 DESCRIPTION

- A. Work Included: Furnish and install acoustic treatment in accordance with the drawings and where specified. Perform noise measurement and reporting activities herein.
- B. Related work specified elsewhere: Section 15890 - Ductwork.

1.02 QUALITY ASSURANCE

- A. Standard:
1. ASHRAE
 2. NFPA

1.03 SUBMITTALS

- A. Product Data: Manufacturer's data sheets
- B. Instructions: Erection and installation instructions.
- C. Test Reports: Factory performance data and field tests.

PART 2 - PRODUCTS

2.01 ACOUSTICAL TREATMENT

- A. Low velocity duct lining: Low velocity supply, return and exhaust ductwork shall be installed with acoustical lining where specified. Such acoustic lining shall be a minimum of 1" thick mat faced duct liner meeting the requirements of NFPA 90-A and be 1-1/2 lb. Per cu. Ft. density fiberglass. Dimensions of lined ducts shown on drawings are the inside dimensions of the duct after the lining has been installed. Duct liner shall be adhered with 100% coverage of Bengamin- Foster 85-20. Mechanical fasteners which do not pierce the sheet metal shall be on 16" centers on top sections (when width exceeds 12") and on sides (when height exceeds 24") All abutting edges of acoustic linings shall be folded under and stapled to insure that all new edges are sealed and all exposed edges of acoustic shall be installed with sheet metal nosing. An inner liner need not be provided to cover acoustic.

1. The following ductwork shall be acoustically lined:
 - a. Built up casing walls and ceiling of all plenums except that lining shall be 2" thick 3 lb. Density and inner liner shall be used for all systems.
 - b. All supply, return and exhaust rectangular ductwork (except kitchen exhaust) within mechanical equipment rooms. If the distance from fan discharge to shaft inlet or mechanical room wall is less than 30'-0" continue acoustical lining to a distance of 30'-0" from fan discharge.
 - c. Return air fan and toilet exhaust fan plenum walls and ceilings, except ining shall be 2" thick 3 lb. Density, (for walk-in fan plenums inner liner shall be used)
 - d. Upstream of toilet exhaust fans a minimum distance of 20'-0"

- e. Transfer air ducts
- f. Downstream of fan coil units
- g. Where shown on drawings

B. Acoustical Performance specifications – General

1. It is the intent of this specification that noise levels due to air conditioning and/or ventilating equipment, ducts, air light fixtures, fan coil units, grilles, registers and diffusers will permit attaining sound pressure levels in occupied spaces conforming to the following NYC curve as explained in the 1960 and later issues of the ASHRAE guide and data book.

| Space | NC Levels |
|-----------------------------|-----------|
| Meeting Rooms | 35 |
| Office/Administration Areas | 35 |
| Lobbies/Corridors | 40 |

2. Grilles, registers, diffusers: The maximum permissible sound power levels in octave bands of grilles, registers and diffusers when operated in an installed condition per plans and specifications, shall be as follows:

| Octave Bands | Maximum PWL re: 10-12 watts | NC-35 | NC-40 | NC-45 | NC-50 |
|--------------|-----------------------------|-------|-------|-------|-------|
| 1 | 64 | 66 | 68 | 70 | |
| 2 | 56 | 60 | 63 | 66 | |
| 3 | 49 | 54 | 58 | 62 | |
| 4 | 46 | 51 | 56 | 61 | |
| 5 | 43 | 48 | 53 | 58 | |
| 6 | 42 | 47 | 52 | 57 | |
| 7 | 41 | 46 | 51 | 56 | |
| 8 | 42 | 47 | 52 | 57 | |

3. Acoustical Performance within equipment space:
 - a. Equipment room noise levels and noise transmission to adjacent buildings shall comply with all Federal, State and City noise ordinances.

PART 3 -EXECUTION

3.01 EXAMINATION

- A. Examine the Contract Documents to become familiar with the scope of work to be performed and the site specific conditions affecting the performance of noise measurement.
- B. Examine approved submittal data of final installed HVAC systems and equipment.
- C. Examine appropriate test reports for systems and equipment requiring factory start-up.
- D. Verify that all system and equipment installations are complete and that required testing, adjusting and balancing specified in the contract documents have been performed.

- E. All equipment requiring vibration isolation must be inspected and the following items should be checked prior to noise measurement :
1. Verify that all isolators are installed in accordance with manufacturer's recommendations.
 2. Verify that piping, duct, and conduit penetrations through mechanical equipment room envelope are sealed, and if required, rigid contact with building structure does not exist.
 3. Steel isolation bases must be inspected for cracked welds, excessive bending or twisting of steel members.
 4. Concrete isolation bases must be examined for cracked concrete. Isolator retainer brackets must be checked for looseness. The concrete base must be flat and true in plane.
 5. Elastomer isolators must be examined for cracks in the rubber and for loose bonds between the rubber and steel plates or other steel components. Adequate clearance must be provided between bolts and the side of the bolt holes to prevent short circuiting.
 6. Steel spring isolators must be examined for loose or missing bolts, nuts or lock washers. Check for spring overloading or under-loading, completely collapsed spring coils, and cocked springs. Note if rubber or glass fiber pad between the bottom plate of the steel spring and the concrete slab or supporting structure is present.
 7. Housed steel springs must be examined for proper centering of the springs, clearance between the cast housing and rubber snubber, and the steel spring for tilted or cocked springs.
 8. Inspect isolators with restraint devices to make sure that all shims have been removed and supportive nuts have been properly adjusted to allow for free floating of the isolated system.
 9. Carefully inspect the space under all isolated bases to assure that these spaces are clean and free of debris.
 10. Check to ensure that all shipping bolts associated with spring isolators have been removed.
 11. Inspect all flexible piping, hoses, and expansion joints as to type, length and location as called for by the specifications. Examine flexible hose for excessive elongation.
 12. Inspect all electrical and control connections to ensure that they do not restrain the movement of the vibration isolated equipment.
 13. Inspect all fabric connections between fans and ductwork to ensure that a fabric "bellows" exists when the fans are operating.
 14. Hanger isolators should be free of misalignment and over / under loading.
- F. Report all deficiencies as discovered to the Commissioner.

3.02 PROCEDURES FOR OUTDOOR SOUND LEVEL MEASUREMENTS

- A. Perform outdoor noise measurements of existing equipment during operation.
- B. Perform outdoor noise measurement when no equipment is operational.
- C. Perform outdoor noise measurements when the ambient noise levels are at a minimum or do not adversely affect the measurement of new HVAC equipment sound levels.

- D. Turn off all exterior sound sources in close proximity to the new HVAC equipment that may affect sound readings.
- E. Position sound level instrument during measurements to achieve a direct line-of-sight between the sound source and the sound-level meter.
- F. Take sound measurements at a height approximately 48 inches above the roof level or prevailing grade and at least 36 inches from any other large surface capable of altering the sound measurements.
- G. Take sound measurements in dB (linear or flat), with the slow time constant, in the octave bands from 31.5 to 8000 Hz.
- H. Take sound measurements with the HVAC systems off to establish the background levels and take sound measurements with the HVAC systems operating. Calculate the difference between measurements. Apply a correction factor depending on the difference and adjust measurements.

3.03 FINAL REPORT

- A. The final report shall be typewritten or computer printout in letter-quality font, on standard bond paper. It shall be bound, tabulated and divided into sections.
- B. The final report shall be in accordance with the requirements of the current edition of the NEBB Procedural Standards for Measurement of Sound and Vibration, or approved equal.
- C. The final certified report shall include, but not limited to the following :
 - 1. Report Title page indicating the Project name, Project location, name of Engineer / Architect of Record, Contractor's name, NEBB Certified Sound and Vibration Firm's name, address, and Certification number.
 - 2. Report Certification Page indicating the Project name, certifying NEBB Qualified Supervisor's name, Firm name, Certification number, Expiration date, certifying NEBB Qualified Supervisor's NEBB Stamp (signed & dated). The Certification page shall also contain the required certification statement.
 - 3. Table of contents with the total number of pages defined for each section of the report. Number each page in the report.
 - 4. Report Summary / Remarks including a narrative description of system set-up conditions, results and deficiencies.
 - 5. Abbreviations page shall include a listing of all abbreviations and their definition as used in the report.
 - 6. Data sheets on Sound and Vibration measurements as described below.
 - 7. Instrument Calibration page indicating a list of the instruments to be used to verify the reported data. The page shall contain the name/type of each instrument, the manufacturer, model number, serial number, calibration date and dates of use.
- D. Sound Measurement Report Forms. Record sound measurements on appropriate test forms, indicating the decibel levels measured for both ambient background and operating HVAC equipment levels.
- E. Record the following information on the test forms submitted :
 - 1. Date and time of test.
 - 2. Equipment operational parameters – speed / frequency at time of measurements.

3. Outdoor measurements – location identifier such as location relative to equipment, building, or property line.
4. Indicate where sound level measurements meet or exceed NYC Building Code and/or NYC Noise Code (LL 113 - 2005) requirements.

END OF SECTION 15792

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SECTION 15822

AIR MONITORING AND DETECTION

PART 1 - GENERAL

The requirements of the Contract Documents, including the General and Supplementary General Conditions, shall apply to the work of this section.

1.01 DESCRIPTION

- A. Work included: Furnish and install continuous air monitoring and detection units.
- B. Related Work Specified Elsewhere: Fire and Smoke Detection: Electrical Division.

1.02 QUALITY ASSURANCE

- A. Standards and Codes
 - 1. ASME
 - 2. NFPA
 - 3. ASHRAE

1.03 SUBMITTALS

- A. Shop drawing indicating location, details, and installation requirements for air monitoring and detection units.
- B. Product Data: Manufacturer's data sheet and installation recommendations.

PART 2 - PRODUCTS

2.01 FIRE AND SMOKE DETECTION

- A. Smoke detection system will be provided and installed by another trade. The contractor will provide suitable openings in sheet metal for sensing elements.
- B. Firestats located in exhaust air systems will be provided and installed by the contractor.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install units in accordance with approved detail drawings and manufacturer's instructions.

3.02 FIELD QUALITY CONTROL

- A. Field test installation in accordance with manufacturer's instructions.

3.03 ADJUSTING

- A. Make all required adjustments so that units are functioning properly.
- B. Replace defective material or equipment at no additional cost.

END OF SECTION 15822

SECTION 15860

CENTRIFUGAL FANS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Centrifugal fans.
- B. Motors and drives
- C. Fan Accessories.

1.02 RELATED WORK

- A. Section 15245 - Vibration Isolation.
- B. Section 15290 - Ductwork Insulation.
- C. Section 15890 - Ductwork.
- D. Section 15910 - Ductwork Accessories.

1.03 REFERENCES

- A. AFBMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
- B. AFBMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
- C. AMCA 99 - Standards Handbook.
- D. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes
- E. AMCA 300 - Test Code for Sound Rating Air Moving Devices.
- F. AMCA 301 - Method of Calculating Fan Sound Ratings from Laboratory Test Data.
- G. NEMA MG1 - Motors and Generators.
- H. NFPA 70 - National Electrical Code.
- I. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

1.04 SUBMITTALS

- A. Submit under provisions of General Conditions.
- B. Shop Drawings: Indicate assembly of centrifugal fans and accessories including fan curves with specified operating point clearly plotted, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.
- C. Product Data: Provide data on centrifugal fans and accessories including fan curves with specified operating point clearly plotted, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions.

1.05 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of General Conditions.
- B. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.06 DELIVERY, STORAGE, AND HANDLING

- 1. Deliver, store, protect and handle products to site under provisions of General Conditions.
- 2. Protect motors, shafts, and bearings from weather and construction dust.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not operate fans for any purpose until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

1.08 EXTRA MATERIALS

- A. Furnish under provisions of General Conditions.
- B. Provide two sets of belts for each fan.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Performance Ratings: Conform to AMCA 210 and bear the AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
- C. Fabrication: Conform to AMCA 99.
- D. Performance Base: Sea level conditions.
- E. Temperature Limit: Maximum 500 degrees F.
- F. Static and Dynamic Balance: Eliminate vibration or noise transmission to occupied areas.

2.02 WHEEL AND INLET

- A. Backward Inclined: Steel construction with smooth curved inlet flange, heavy back plate, backwardly curved blades welded or riveted to flange and back plate; cast iron or cast steel hub riveted to back plate and keyed to shaft with set screws.
- B. Forward Curved: Galvanized steel construction with inlet flange, back plate, shallow blades with inlet and tip curved forward in direction of airflow, mechanically secured to flange and back plate; steel hub swaged to back plate and keyed to shaft with set screw.
- C. Airfoil Wheel: Steel construction with smooth curved inlet flange, heavy back plate die formed hollow airfoil shaped blades continuously welded at tip flange, and back plate; cast iron or cast steel hub riveted to back plate and keyed to shaft with set screws.
- D. Radial: Steel construction with inlet flange, heavy reinforced back plate, plate blades with reinforcing gussets and wearing strips welded or riveted to back plate and flange; cast iron or cast steel hub riveted to back plate and keyed to shaft with set screws.

2.03 HOUSING

- A. Heavy gage steel, spot welded for AMCA 99 Class I and II fans, and continuously welded for Class III, adequately braced, designed to minimize turbulence with spun inlet bell and shaped cut-off.
- B. Factory finish before assembly with enamel or prime coat.
- C. Provide bolted construction with horizontal flanged split housing.

2.04 BEARINGS AND DRIVES

- A. Bearings: L-50 life at 100,000 hours heavy duty pillow block type, self-aligning, grease-lubricated ball bearings.
- B. Shafts: Hot rolled steel, ground and polished, with key- way, protectively coated with lubricating oil, and shaft guard.
- C. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, keyed. Variable and adjustable pitch sheaves for motors 15 hp and under, selected so required rpm is obtained with sheaves set at mid-position. Fixed sheave for 20 hp and over, matched belts, and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of the motor.
- D. Belt Guard: Fabricate to SMACNA Standard; of 12 gage thick, 3/4 inch diamond mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.

2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Motor: Refer to Section 15170. NEMA MG1.
- B. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.

2.06 IN-LINE FAN

- A. Fans shall be belt driven inline type. The fan housing shall be of heavy gauge formed steel. One of the sides shall be hinged and shall support the entire drive assembly and wheel allowing the assembly to swing out for cleaning, inspection, or service without dismantling the unit in any way. The motor shall be mounted on the hinged side exterior isolated from the airstream. The belt and pillow block ball bearings shall be protected from the airstream by an enclosure. The shaft shall be keyed to both the wheel and pulley. Fan shall be COOK, Greenheck or approved equal.
- B. The fan inlet shall be spun Venturi throat overlapped by a backward curved centrifugal wheel with spun cone for maximum performance.
- C. Air and sound rating shall be AMCA certified.

2.07 MANUFACTURERS

- A. Acceptable manufacturers shall be one of the following:
 - 1. Greenheck
 - 2. Cook Fan Co.
 - 3. Penn Ventilator Co.

2.10 ACCESSORIES

- A. Access Doors: Shaped to conform to scroll, with quick opening latches and gaskets.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install fans as indicated, specified, with resilient mountings and flexible electrical leads.
- C. Install flexible connections specified in Section 15910 between fan inlet and discharge ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
- D. Install fan restraining snubbers as required. Adjust snubbers to prevent tension in flexible connectors when fan is operating.
- E. Provide fixed sheaves required for final air balance.
- F. Provide safety screen where inlet or outlet is exposed.
- G. Pipe scroll drains to nearest floor drain.
- H. Provide backdraft dampers on discharge of exhaust fans and as indicated. Refer to Section 15910.

END OF SECTION 15860

SECTION 15861

AIR FILTERS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

- A. This Section includes factory-fabricated air-filter devices and media used to remove particulate matter from air for HVAC applications.

1.03 SUBMITTALS

- A. Product Data: Include dimensions; shipping, installed, and operating weights; required clearances and access; rated flow capacity, including initial and final pressure drop at rated airflow; efficiency and test method; fire classification; furnished specialties; and accessories for each model indicated.

1.04 QUALITY ASSURANCE

- A. Comply with NFPA 90A and NFPA 90B.
- B. ASHRAE Compliance: Comply with provisions of ASHRAE 52.1 for method of testing and rating air-filter units.
- C. Comply with ARI 850.

1.05 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Provide one complete set of filters for each filter bank.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Air Filters:
 - a. AAF International.
 - b. Barnebey & Sutcliffe Corp.
 - c. Continental Air Filter Div.; NiCon Filter Corp.
 - d. Flanders Filters, Inc.
 - e. International Air Filter, Inc.
 - f. Koch Filter Corp.
 - g. Research Products Corp.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install filter frames according to manufacturer's written instructions.
- B. Position each filter unit with clearance for normal service and maintenance. Anchor filter holding frames to substrate.
- C. Install filters in position to prevent passage of unfiltered air.
- D. Coordinate filter installations with duct and air-handling unit installations.

3.02 CLEANING

- A. After completing system installation and testing, adjusting, and balancing air-handling and air-distribution systems, clean filter housings and install new filter media.

END OF SECTION 15861

SECTION 15890

DUCTWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Metal ductwork.
- B. Casing and plenums.
- C. Duct cleaning.

1.02 RELATED SECTIONS

- A. Section 15140 - Supports and Anchors: Sleeves.
- B. Section 15290 - Duct Insulation: External insulation and duct liner.
- C. Section 15910 - Ductwork Accessories.
- D. Section 15940 - Air Outlets and Inlets.
- E. Section 15990 - Testing, Adjusting and Balancing.

1.03 REFERENCES

- A. ASTM A 90 - Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
- B. ASTM A 527 - Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process, Lock Forming Quality.
- C. AWS D9.1 - Welding of Sheet Metal.
- D. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
- E. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems.
- F. NFPA 91 - Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying.
- G. NFPA 96 - Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment.
- H. SMACNA - HVAC Air Duct Leakage Test Manual.
- I. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- J. UL 181 - Factory-Made Air Ducts and Connectors.

1.04 SUBMITTALS

- A. Submit under provisions of General Conditions.

- B. Shop Drawings: Indicate duct fittings, particulars such as gages, sizes, welds, and configuration prior to start of work
- C. Product Data: Provide data for duct materials duct liner duct connectors.
- D. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.
- E. Manufacturer's Installation Instructions: Indicate special procedures for glass fiber ducts.
- F. Manufacturer's Certificate: Certify that installation of glass fiber ductwork meet or exceed specified requirements recommended fabrication and installation requirements.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of General Conditions.
- B. Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- B. Maintain one copy of document on site.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing the work of this section with minimum three years documented experience.

1.08 REGULATORY REQUIREMENTS

- A. Construct ductwork to NFPA 90A and NFPA 90B and NFPA 96 standards.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures during and after installation of duct sealants.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Galvanized Steel Ducts: ASTM A525 and ASTM A527 galvanized steel sheet, lock-forming quality, having zinc coating of in conformance with ASTM A90.
- B. Steel Ducts: ASTM A366, A569 or A568.
- C. Aluminum Ducts: ASTM B209; aluminum sheet, alloy 3003-H14. Aluminum Connectors and Bar

Stock: Alloy 6061-T6 or of equivalent strength.

1. UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring steel wire; fiberglass insulation; polyethylene aluminized vapor barrier film.
 2. Pressure Rating: 10 inches WG positive and 1.0 inches WG negative.
 3. Maximum Velocity: 4000 fpm.
 4. Temperature Range: -20 degrees F to 210 degrees F.
- D. Fasteners: Rivets, bolts, or sheet metal screws.
- E. Sealant:
1. Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic.
- D. Hanger Rod: ASTM A36; steel; threaded both ends, threaded one end, or continuously threaded.

2.02 DUCTWORK FABRICATION

- A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide air foil turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.
- C. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- D. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Joints shall be minimum 4 inch (100 mm) cemented slip joint, brazed or electric welded. Prime coat welded joints.
- E. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

2.03 MANUFACTURED DUCTWORK AND FITTINGS

- A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- C. Duct Sizes are inside clear dimensions. For lined ducts, maintain sizes inside lining.

- D. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
- E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- F. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.
- G. Use double nuts and lock washers on threaded rod supports.
- H. Connect diffusers or light troffer boots to low pressure ducts directly.
- I. Connect flexible ducts to metal ducts with draw bands.
- J. Set plenum doors 6 to 12 inches above floor. Arrange door swings so that fan static pressure holds door in closed position.
- K. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

3.02 CLEANING

- A. Clean work under provisions of General Conditions.
- B. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment which may be harmed by excessive dirt with temporary filters, or bypass during cleaning.
- C. Clean duct systems with high power vacuum machines. Protect equipment which may be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

3.03 SCHEDULES

A DUCTWORK MATERIAL SCHEDULE

- 1. AIR SYSTEM
 - a. Low Pressure Supply
 - b. Return and Relief
 - c. General Exhaust
 - d. Toilet Exhaust
 - e. Trash Exhaust
 - f. Outside Air Intake
 - g. Combustion Air

END OF SECTION 15890

SECTION 15900

HVAC INSTRUMENTATION AND CONTROLS

PART 1: GENERAL

1.1 Products Furnished But Not Installed Under This Section

- A. Control valves

1.2 Products Installed But Not Furnished Under This Section

- None

1.3 Products Not Furnished or Installed but integrated with the Work of this Section

- None

1.4 Related Sections

- A. The General Conditions of the Contract, Supplementary Conditions, and General Requirements are part of this specification and shall be used in conjunction with this section as part of the contract documents.

1.5 Description

- A. General: The control system shall consist of a high-speed, peer-to-peer network of DDC controllers and a web-based operator interface. Depict each mechanical system and building floor plan by a point-and-click graphic. A web server with a network interface card shall gather data from this system and generate web pages accessible through a conventional web browser on each PC connected to the network. Operators shall be able to perform all normal operator functions through the web browser interface.
- B. Proprietary Item: 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.
 - 1. Allowance Amount: Not to Exceed \$18,200.
 - 2. 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. The system shall directly control HVAC equipment as specified in Section 15985 – Sequence of Operations for HVAC Controls. Each zone controller shall provide occupied and unoccupied modes of operation by individual zone. Furnish energy conservation features such as optimal start and stop, night setback, request-based logic, and demand level adjustment of setpoints as specified in the sequence.
- D. Provide for future system expansion to include monitoring of occupant card access, fire alarm, and lighting control systems.
- E. System shall use the BACnet protocol for communication to the operator workstation or web server and for communication between control modules. I/O points, schedules, setpoints, trends, and alarms specified in Section 15985 – "Sequence of Operations for HVAC Controls" shall be BACnet objects.

1.6 Approved Control Systems

- A. The following are approved control system suppliers, manufacturers, and product lines:

| Supplier | Manufacturer | Product Line |
|-----------|--------------|----------------|
| Honeywell | Honeywell | Honeywell WEBs |

- B. The above list is alphabetical and does not indicate preference. Inclusion on this list does not guarantee acceptance of products or installation. Control systems shall comply with the terms of this specification.
1. The Contractor shall use only operator workstation software, controller software, custom application programming language, and controllers from the corresponding manufacturer and product line unless City of New York approves use of multiple manufacturers.
 2. Other products specified herein (such as sensors, valves, dampers, and actuators) need not be manufactured by the above manufacturers.

1.7 Quality Assurance

- A. Installer and Manufacturer Qualifications

1. Installer shall have an established working relationship with Control System Manufacturer.
2. Installer shall have successfully completed Control System Manufacturer's control system training. Upon request, Installer shall present record of completed training including course outlines.

1.8 Codes And Standards

- A. Work, materials, and equipment shall comply with the most restrictive of local, state, and federal authorities' codes and ordinances or these plans and specifications. As a minimum, the installation shall comply with current editions in effect 30 days prior to receipt of bids of the following codes:
1. National Electric Code (NEC)
 2. International Building Code (IBC)
 - a. Section 719 Ducts and Air Transfer Openings
 - b. Section 907 Fire Alarm and Detection Systems
 - c. Section 909 Smoke Control Systems
 - d. Chapter 28 Mechanical
 3. International Mechanical Code (IMC)
 4. ANSI/ASHRAE 135-2004: Data Communication Protocol for Building Automation and Control Systems (BACNET)

1.9 System Performance

- A. Performance Standards. System shall conform to the following minimum standards over network connections. Systems shall be tested using manufacturer's recommended hardware and software for operator workstation (server and browser for web-based systems).
1. Graphic Display. A graphic with 20 dynamic points shall display with current data within 10 sec.
 2. Graphic Refresh. A graphic with 20 dynamic points shall update with current data within 8 sec. and shall automatically refresh every 15 sec.
 3. Configuration and Tuning Screens. Screens used for configuring, calibrating, or tuning points, PID loops, and similar control logic shall automatically refresh within 6 sec.
 4. Object Command. Devices shall react to command of a binary object within 2 sec. Devices shall begin reacting to command of an analog object within 2 sec.

5. Alarm Response Time. An object that goes into alarm shall be annunciated at the workstation within 15 sec.
6. Program Execution Frequency. Custom and standard applications shall be capable of running as often as once every 5 sec. Select execution times consistent with the mechanical process under control.
7. Performance. Programmable controllers shall be able to completely execute DDC PID control loops at a frequency adjustable down to once per sec. Select execution times consistent with the mechanical process under control.
8. Multiple Alarm Annunciation. Each workstation on the network shall receive alarms within 5 sec of other workstations.
9. Reporting Accuracy. System shall report values with minimum end-to-end accuracy listed in Table 1.
10. Control Stability and Accuracy. Control loops shall maintain measured variable at setpoint within tolerances listed in Table 2.

Table 1
Reporting Accuracy

| Measured Variable | Reported Accuracy |
|------------------------------------|---|
| Space Temperature | $\pm 0.5^{\circ}\text{C}$ ($\pm 1^{\circ}\text{F}$) |
| Ducted Air | $\pm 0.5^{\circ}\text{C}$ ($\pm 1^{\circ}\text{F}$) |
| Outside Air | $\pm 1.0^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$) |
| Dew Point | $\pm 1.5^{\circ}\text{C}$ ($\pm 3^{\circ}\text{F}$) |
| Water Temperature | $\pm 0.5^{\circ}\text{C}$ ($\pm 1^{\circ}\text{F}$) |
| Delta-T | $\pm 0.15^{\circ}\text{C}$ ($\pm 0.25^{\circ}\text{F}$) |
| Relative Humidity | $\pm 5\%$ RH |
| Water Flow | $\pm 2\%$ of full scale |
| Airflow (terminal) | $\pm 10\%$ of full scale (see Note 1) |
| Airflow (measuring stations) | $\pm 5\%$ of full scale |
| Airflow (pressurized spaces) | $\pm 3\%$ of full scale |
| Air Pressure (ducts) | ± 25 Pa (± 0.1 in. w.g.) |
| Air Pressure (space) | ± 3 Pa (± 0.01 in. w.g.) |
| Water Pressure | $\pm 2\%$ of full scale (see Note 2) |
| Electrical (A, V, W, Power Factor) | $\pm 1\%$ of reading (see Note 3) |
| Carbon Monoxide (CO) | $\pm 5\%$ of reading |
| Carbon Dioxide (CO ₂) | ± 50 ppm |

Note 1: Accuracy applies to 10% - 100% of scale
 Note 2: For both absolute and differential pressure
 Note 3: Not including utility-supplied meters

Table 2
 Control Stability and Accuracy

| Controlled Variable | Control Accuracy | Range of Medium |
|---------------------|--|---|
| Air Pressure | ±50 Pa (±0.2 in. w.g.)
±3 Pa (±0.01 in. w.g.) | 0-1.5 kPa (0-6 in. w.g.)
-25 to 25 Pa (-0.1 to 0.1 in. w.g.) |
| Airflow | ±10% of full scale | |
| Space Temperature | ±1.0°C (±2.0°F) | |
| Duct Temperature | ±1.5°C (±3°F) | |
| Humidity | ±5% RH | |
| Fluid Pressure | ±10 kPa (±1.5 psi)
±250 Pa (±1.0 in. w.g.) | MPa (1-150 psi)
0-12.5 kPa (0-50 in. w.g.) differential |

1.10 Submittals

A. Product Submittal Requirements: Meet requirements of General Conditions on Shop Drawings, Product Data, and Samples. Provide six copies of shop drawings and other submittals on hardware, software, and equipment to be installed or furnished. Begin no work until submittals have been approved for conformity with design intent. Provide drawings as AutoCAD 2006 (or newer) compatible files on magnetic or optical disk (file format: .DWG, .DXF, .VSD, or comparable) and 3 prints of each drawing on 11" x 17" paper. When manufacturer's cutsheets apply to a product series rather than a specific product, clearly indicate applicable data by highlighting or by other means. Clearly reference covered specification and drawing on each submittal. General catalogs shall not be accepted as cutsheets to fulfill submittal requirements. Select and show submittal quantities appropriate to scope of work. Submittal approval does not relieve Contractor of responsibility to supply sufficient quantities to complete work. Provide submittals within 12 weeks of contract award on the following:

I. Direct Digital Control System Hardware

- a. Complete bill of materials indicating quantity, manufacturer, model number, and relevant technical data of equipment to be used.
- b. Manufacturer's description and technical data such as performance curves, product specifications, and installation and maintenance instructions for items listed below and for relevant items not listed below:
 - i. Direct digital controllers (controller panels)
 - ii. Transducers and transmitters
 - iii. Sensors (include accuracy data)
 - iv. Actuators
 - v. Valves
 - vi. Relays and switches
 - vii. Control panels
 - viii. Power supplies
 - ix. Batteries

- x. Operator interface equipment
 - xi. Wiring
 - c. Wiring diagrams and layouts for each control panel. Show termination numbers.
 - d. Floor plan schematic diagrams indicating field sensor and controller locations.
 - e. Riser diagrams showing control network layout, communication protocol, and wire types.
- 2. Central System Hardware and Software
 - a. Complete bill of material indicating quantity, manufacturer, model number, and relevant technical data of equipment used.
 - b. Manufacturer's description and technical data such as product specifications and installation and maintenance instructions for items listed below and for relevant items furnished under this contract not listed below:
 - i. Central Processing Unit (CPU) or web server
 - ii. Monitors
 - iii. Keyboards
 - iv. Power supplies
 - v. Battery backups
 - vi. Interface equipment between CPU or server and control panels
 - vii. Operating System software
 - viii. Operator interface software
 - ix. Color graphic software
 - x. Third-party software
 - c. Schematic diagrams of control, communication, and power wiring for central system installation. Show interface wiring to control system.
 - d. Network riser diagrams of wiring between central control unit and control panels.
- 3. Controlled Systems
 - a. Riser diagrams showing control network layout, communication protocol, and wire types.
 - b. Schematic diagram of each controlled system. Label control points with point names. Graphically show locations of control elements.
 - c. Schematic wiring diagram of each controlled system. Label control elements and terminals. Where a control element is also shown on control system schematic, use the same name.
 - d. Instrumentation list (Bill of Materials) for each controlled system. List each control system element in a table. Show element name, type of device, manufacturer, model number, and product data sheet number.
 - e. Complete description of control system operation including sequences of operation. Include and reference schematic diagram of controlled system. List I/O points and software points specified in Section 15985. Indicate alarmed and trended points.
- 4. Description of process, report formats, and checklists to be used in Section 15900 Article 3.16 (Control System Demonstration and Acceptance).
- 5. BACnet Protocol Implementation Conformance Statement (PICS) for each submitted type of controller and operator interface.

B. Schedules

- 1. Schedule of work provided within one month of contract award, indicating:
 - a. Intended sequence of work items

- b. Start date of each work item
 - c. Duration of each work item
 - d. Planned delivery dates for ordered material and equipment and expected lead times
 - e. Milestones indicating possible restraints on work by other trades or situations
2. Monthly written status reports indicating work completed and revisions to expected delivery dates. Include updated schedule of work.
- C. Project Record Documents. Submit three copies of record (as-built) documents upon completion of installation for approval prior to final completion. Submittal shall consist of:
- 1. Project Record Drawings. As-built versions of submittal shop drawings provided as AutoCAD 2006 (or newer) compatible files on magnetic or optical disk (file format: .DWG, .DXF, .VSD, or comparable) and 6 prints of each drawing on 11" x 17" paper.
 - 2. Testing and Commissioning Reports and Checklists. Completed versions of reports, checklists, and trend logs used to meet requirements of Section 15900 Article 3.16 (Control System Demonstration and Acceptance).
 - 3. Operation and Maintenance (O&M) Manual. Printed, electronic, or online help documentation of the following:
 - a. As-built versions of submittal product data.
 - b. Names, addresses, and telephone numbers of installing contractors and service representatives for equipment and control systems.
 - c. Operator's manual with procedures for operating control systems: logging on and off, handling alarms, producing point reports, trending data, overriding computer control, and changing setpoints and variables.
 - d. Programming manual or set of manuals with description of programming language and syntax, of statements for algorithms and calculations used, of point database creation and modification, of program creation and modification, and of editor use.
 - e. Engineering, installation, and maintenance manual or set of manuals that explains how to design and install new points, panels, and other hardware; how to perform preventive maintenance and calibration; how to debug hardware problems; and how to repair or replace hardware.
 - f. Documentation of programs created using custom programming language including setpoints, tuning parameters, and object database. Electronic copies of programs shall meet this requirement if control logic, setpoints, tuning parameters, and objects can be viewed using furnished programming tools.
 - g. Graphic files, programs, and database on magnetic or optical media.
 - h. List of recommended spare parts with part numbers and suppliers.
 - i. Complete original-issue documentation, installation, and maintenance information for furnished third-party hardware including computer equipment and sensors.
 - j. Complete original-issue copies of furnished software, including operating systems, custom programming language, operator workstation or web server software, and graphics software.
 - k. Licenses, guarantees, and warranty documents for equipment and systems.
 - l. Recommended preventive maintenance procedures for system components, including schedule of tasks such as inspection, cleaning, and calibration; time between tasks; and task descriptions.
- D. Training Materials: Provide course outline and materials for each class at least six weeks before first class. Training shall be furnished via instructor-led sessions, computer-based training, or web-based training. Commissioner will modify course outlines and materials if necessary to meet the City of New York's needs. Commissioner will review and approve course outlines and materials at least three weeks before first class.

1.11 Warranty

- A. Warrant work as follows:

1. Warrant labor and materials for specified control system free from defects for a period of 12 months after final acceptance. Control system failures during warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to the City of New York. Respond during normal business hours within 24 hours of City of New York's warranty service request.
2. Provide updates to operator workstation or web server software, project-specific software, graphic software, database software, and firmware that resolve Contractor-identified software deficiencies at no charge during warranty period. If available, the City of New York can purchase in-warranty service agreement to receive upgrades for functional enhancements associated with above-mentioned items. Do not install updates or upgrades without City of New York's written authorization.
3. Exception: Contractor shall not be required to warrant reused devices except those that have been rebuilt or repaired. Installation labor and materials shall be warranted. Demonstrate operable condition of reused devices at time of Commissioner's acceptance.

1.12 Ownership Of Proprietary Material

- A. Project-specific software and documentation shall become City of New York's property. This includes, but is not limited to:
 1. Graphics
 2. Record drawings
 3. Database
 4. Application programming code
 5. Documentation

PART 2- PRODUCTS

2.1 Materials

- A. Use new products the manufacturer is currently manufacturing and selling for use in new installations. Do not use this installation as a product test site unless explicitly approved in writing by City of New York. Spare parts shall be available for at least five years after completion of this contract.

2.2 Communication

- A. Control products, communication media, connectors, repeaters, hubs, and routers shall comprise a BACnet internetwork. Controller and operator interface communication shall conform to ANSI/ASHRAE Standard 135-2004, BACnet.
- B. Install new wiring and network devices as required to provide a complete and workable control network.
- C. Each controller shall have a communication port for temporary connection to a laptop computer or other operator interface. Connection shall support memory downloads and other commissioning and troubleshooting operations.
- D. Internetwork operator interface and value passing shall be transparent to internetwork architecture.
 1. An operator interface connected to a controller shall allow the operator to interface with each internetwork controller as if directly connected. Controller information such as data, status, and control algorithms shall be viewable and editable from each internetwork controller.
 2. Inputs, outputs, and control variables used to integrate control strategies across multiple controllers shall be readable by each controller on the internetwork. Program and test all cross-controller links required to execute control strategies specified in Section 15985. An authorized operator shall be able to edit cross-controller links by typing a standard object address or by using a point-and-click interface.
- E. Controllers with real-time clocks shall use the BACnet Time Synchronization service. System shall automatically synchronize system clocks daily from an operator-designated controller via the internetwork. If applicable, system shall automatically adjust for daylight saving and standard time.
- F. System shall be expandable to at least twice the required input and output objects with additional controllers, associated devices, and wiring.

- G. System shall support Web services data exchange with any other system that complies with XML (extensible markup language) and SOAP (simple object access protocol) standards specified by the Web Services Interoperability Organization (WS-I) Basic Profile 1.0 or higher. Web services support shall as a minimum be provided at the workstation or web server level and shall enable data to be read from or written to the system.
1. System shall support Web services read data requests by retrieving requested trend data or point values (I/O hardware points, analog value software points, or binary value software points) from any system controller or from the trend history database.
 2. System shall support Web services write data request to each analog and binary object that can be edited through the system operator interface by downloading a numeric value to the specified object.
 3. For read or write requests, the system shall require user name and password authentication and shall support SSL (Secure Socket Layer) or equivalent data encryption.
 4. System shall support discovery through a Web services connection or shall provide a tool available through the Operator Interface that will reveal the path/identifier needed to allow a third party Web services device to read data from or write data to any object in the system which supports this service.

2.3 Operator Interface

- A. Operator Interface. Web server shall reside on high-speed network with building controllers. Each standard browser connected to server shall be able to access all system information.
- B. Communication. Web server or workstation and controllers shall communicate using BACnet protocol. Web server or workstation and control network backbone shall communicate using ISO 8802-3 (Ethernet) Data Link/Physical layer protocol and BACnet/IP addressing as specified in ANSI/ASHRAE 135-2004, BACnet Annex J.
- C. Hardware. Each workstation or web server shall consist of the following:
1. Hardware Base. Industry-standard hardware shall meet or exceed DDC system manufacturer's recommended specifications and shall meet response times specified in Section 15900 Paragraph 1.9. Hard disk shall have sufficient memory to store system software, one year of data for trended points specified in Section 15985, and a system database at least twice the size of the existing database at system acceptance. Configure computers and network connections if multiple computers are required to meet specified memory and performance. Web server or workstations shall be IBM-compatible PCs with a minimum of:
 - a. Intel Core 2 Duo 3 GHz processor
 - b. 2 GB RAM
 - c. 80 GB hard disk providing data at 100 MB/sec
 - d. 24x CD-RW/DVD drive
 - e. Serial, parallel, and network communication ports and cables required for proper system operation
- D. Operator Functions. Operator interface shall allow each authorized operator to execute the following functions as a minimum:
1. Log In and Log Out. System shall require user name and password to log in to operator interface.
 2. Point-and-click Navigation. Operator interface shall be graphically based and shall allow operators to access graphics for equipment and geographic areas using point-and-click navigation.
 3. View and Adjust Equipment Properties. Operators shall be able to view controlled equipment status and to adjust operating parameters such as setpoints, PID gains, on and off controls, and sensor calibration.
 4. View and Adjust Operating Schedules. Operators shall be able to view scheduled operating hours of each schedulable piece of equipment on a weekly or monthly calendar-based graphical schedule display, to select and adjust each schedule and time period, and to simultaneously schedule related equipment. System shall clearly show exception schedules and holidays on the schedule display.
 5. View and Respond to Alarms. Operators shall be able to view a list of currently active system alarms, to acknowledge each alarm, and to clear (delete) unneeded alarms.

6. View and Configure Trends. Operators shall be able to view a trend graph of each trended point and to edit graph configuration to display a specific time period or data range. Operator shall be able to create custom trend graphs to display on the same page data from multiple trended points.
7. View and Configure Reports. Operators shall be able to run preconfigured reports, to view report results, and to customize report configuration to show data of interest.
8. Manage Control System Hardware. Operators shall be able to view controller status, to restart (reboot) each controller, and to download new control software to each controller.
9. Manage Operator Access. Typically, only a few operators are authorized to manage operator access. Authorized operators shall be able to view a list of operators with system access and of functions they can perform while logged in. Operators shall be able to add operators, to delete operators, and to edit operator function authorization. Operator shall be able to authorize each operator function separately.

E. System Software.

1. Operating System. Web server shall have an industry-standard professional-grade operating system. Acceptable systems include Microsoft Vista, Microsoft Windows XP Pro, Red Hat Linux, or Sun Solaris.
2. System Graphics. Operator interface shall be graphically based and shall include at least one graphic per piece of equipment or occupied zone, graphics for each chilled water and hot water system, and graphics that summarize conditions on each floor of each building included in this contract. Indicate thermal comfort on floor plan summary graphics using dynamic colors to represent zone temperature relative to zone setpoint.
 - a. Functionality. Graphics shall allow operator to monitor system status, to view a summary of the most important data for each controlled zone or piece of equipment, to use point-and-click navigation between zones or equipment, and to edit setpoints and other specified parameters.
 - b. Animation. Graphics shall be able to animate by displaying different image files for changed object status.
 - c. Alarm Indication. Indicate areas or equipment in an alarm condition using color or other visual indicator.
 - d. Format. Graphics shall be saved in an industry-standard format such as BMP, JPEG, PNG, or GIF. Web-based system graphics shall be viewable on browsers compatible with World Wide Web Consortium browser standards. Web graphic format shall require no plug-in (such as HTML and JavaScript) or shall only require widely available no-cost plug-ins (such as Active-X and Macromedia Flash).
- F. System Tools. System shall provide the following functionality to authorized operators as an integral part of the operator interface or as stand-alone software programs. If furnished as part of the interface, the tool shall be available from each workstation or web browser interface. If furnished as a stand-alone program, software shall be installable on standard IBM-compatible PCs with no limit on the number of copies that can be installed under the system license.
 1. Automatic System Database Configuration. Each workstation or web server shall store on its hard disk a copy of the current system database, including controller firmware and software. Stored database shall be automatically updated with each system configuration or controller firmware or software change.
 2. Controller Memory Download. Operators shall be able to download memory from the system database to each controller.
 3. System Configuration. Operators shall be able to configure the system.
 4. Online Help. Context-sensitive online help for each tool shall assist operators in operating and editing the system.
 5. Security. System shall require a user name and password to view, edit, add, or delete data.
 - a. Operator Access. Each user name and password combination shall define accessible viewing, editing, adding, and deleting functions in each system application, editor, and object. Authorized operators shall be able to vary and deny each operator's accessible functions based on equipment or geographic location.

- b. Automatic Log Out. Automatically log out each operator if no keyboard or mouse activity is detected. Operators shall be able to adjust automatic log out delay.
 - c. Encrypted Security Data. Store system security data including operator passwords in an encrypted format. System shall not display operator passwords.
- 6. System Diagnostics. System shall automatically monitor controller and I/O point operation. System shall annunciate controller failure and I/O point locking (manual overriding to a fixed value).
- 7. Alarm Processing. System input and status objects shall be configurable to alarm on departing from and on returning to normal state. Operator shall be able to enable or disable each alarm and to configure alarm limits, alarm limit differentials, alarm states, and alarm reactions for each system object. Configure and enable alarm points as specified in Section 15985 – Sequence of Operations for HVAC Controls. Alarms shall be BACnet alarm objects and shall use BACnet alarm services.
- 8. Alarm Messages. Alarm messages shall use an English language descriptor without acronyms or mnemonics to describe alarm source, location, and nature.
- 9. Alarm Reactions. Operator shall be able to configure (by object) actions workstation or web server shall initiate on receipt of each alarm. As a minimum, workstation or web server shall be able to log, print, start programs, display messages, send e-mail, send page, and audibly annunciate.
- 10. Alarm Maintenance. Operators shall be able to view system alarms and changes of state chronologically, to acknowledge and delete alarms, and to archive closed alarms to the workstation or web server hard disk from each workstation or web browser interface.
- 11. Trend Configuration. Operator shall be able to configure trend sample or change of value (COV) interval, start time, and stop time for each system data object and shall be able to retrieve data for use in spreadsheets and standard database programs. Controller shall sample and store trend data and shall be able to archive data to the hard disk. Configure trends as specified in Section 15985 – Sequence of Operations for HVAC Controls. Trends shall be BACnet trend objects.
- 12. Object and Property Status and Control. Operator shall be able to view, and to edit if applicable, the status of each system object and property by menu, on graphics, or through custom programs.
- 13. Reports and Logs. Operator shall be able to select, to modify, to create, and to print reports and logs. Operator shall be able to store report data in a format accessible by standard spreadsheet and word processing programs.
- 14. Standard Reports. Furnish the following standard system reports:
 - a. Objects. System objects and current values filtered by object type, by status (in alarm, locked, normal), by equipment, by geographic location, or by combination of filter criteria.
 - b. Alarm Summary. Current alarms and closed alarms. System shall retain closed alarms for an adjustable period.
 - c. Logs. System shall log the following to a database or text file and shall retain data for an adjustable period:
 - i. Alarm History.
 - ii. Trend Data. Operator shall be able to select trends to be logged.
 - iii. Operator Activity. At a minimum, system shall log operator log in and log out, control parameter changes, schedule changes, and alarm acknowledgment and deletion. System shall date and time stamp logged activity.
- 15. Environmental Index. System shall monitor all occupied zones and compile an index that provides a numerical indication of the environmental comfort within the zone. As a minimum, this indication shall be based upon the deviation of the zone temperature from the heating or cooling setpoint. If humidity is being measured within the zone then the environmental index shall be adjusted to reflect a lower comfort level for high or low humidity levels. Similarly, if carbon dioxide levels are being measured as an indication of ventilation effectiveness then the environmental index shall be adjusted to indicate degraded comfort at high carbon dioxide levels. Other adjustments may be made to the environmental index based upon additional measurements. The system shall maintain a trend of the environmental index for each zone in the trend log. The system shall also compute an average comfort index for every building

included in this contract and maintain trend logs of these building environmental indices. Similarly, the system shall compute the percentage of occupied time that comfortable conditions were maintained within the zones. Through the UI the user shall be able to add a weighting factor to adjust the contribution of each zone to the average index based upon the floor area of the zone, importance of the zone, or other static criteria.

16. Custom Reports. Operator shall be able to create custom reports that retrieve data, including archived trend data, from the system, that analyze data using common algebraic calculations, and that present results in tabular or graphical format. Reports shall be launched from the operator interface.
17. Graphics Generation. Graphically based tools and documentation shall allow Operator to edit system graphics, to create graphics, and to integrate graphics into the system. Operator shall be able to add analog and binary values, dynamic text, static text, and animation files to a background graphic using a mouse.
18. Graphics Library. Complete library of standard HVAC equipment graphics shall include equipment such as chillers, boilers, air handlers, terminals, fan coils, and unit ventilators. Library shall include standard symbols for other equipment including fans, pumps, coils, valves, piping, dampers, and ductwork. Library graphic file format shall be compatible with graphics generation tools.
19. Custom Application Programming. Operator shall be able to create, edit, debug, and download custom programs. System shall be fully operable while custom programs are edited, compiled, and downloaded. Programming language shall have the following features:
 - a. Language. Language shall be graphically based and shall use function blocks arranged in a logic diagram that clearly shows control logic flow. Function blocks shall directly provide functions listed below, and operators shall be able to create custom or compound function blocks.
 - b. Programming Environment. Tool shall provide a full-screen, cursor-and-mouse-driven programming environment that incorporates word processing features such as cut and paste. Operators shall be able to insert, add, modify, and delete custom programming code, and to copy blocks of code to a file library for reuse in other control programs.
 - c. Independent Program Modules. Operator shall be able to develop independently executing program modules that can disable, enable and exchange data with other program modules.
 - d. Debugging and Simulation. Operator shall be able to step through the program observing intermediate values and results. Operator shall be able to adjust input variables to simulate actual operating conditions. Operator shall be able to adjust each step's time increment to observe operation of delays, integrators, and other time-sensitive control logic. Debugger shall provide error messages for syntax and for execution errors.
 - e. Conditional Statements. Operator shall be able to program conditional logic using compound Boolean (AND, OR, and NOT) and relational (EQUAL, LESS THAN, GREATER THAN, NOT EQUAL) comparisons.
 - f. Mathematical Functions. Language shall support floating-point addition, subtraction, multiplication, division, and square root operations, as well as absolute value calculation and programmatic selection of minimum and maximum values from a list of values.
 - g. Variables: Operator shall be able to use variable values in program conditional statements and mathematical functions.
 - i. Time Variables. Operator shall be able to use predefined variables to represent time of day, day of the week, month of the year, and date. Other predefined variables or simple control logic shall provide elapsed time in seconds, minutes, hours, and days. Operator shall be able to start, stop, and reset elapsed time variables using the program language.
 - ii. System Variables. Operator shall be able to use predefined variables to represent status and results of Controller Software and shall be able to enable, disable, and change setpoints of Controller Software as described in Controller Software section.
- G. Portable Operator's Terminal. Provide all necessary software to configure an IBM-compatible laptop computer for use as a Portable Operator's Terminal. Operator shall be able to connect configured Terminal to the system network or directly to each controller for programming, setting up, and troubleshooting.

- H. BACnet. Web server or workstation shall have demonstrated interoperability during at least one BMA Interoperability Workshop and shall substantially conform to BACnet Operator Workstation (B-OWS) device profile as specified in ASHRAE/ANSI 135-2001, BACnet Annex L.

2.4 Controller Software

- A. Building and energy management application software shall reside and operate in system controllers. Applications shall be editable through operator workstation, web browser interface, or engineering workstation.
- B. System Security. See Paragraph 2.3.F.5 (Security) and Paragraph 2.3.F.15.c (Operator Activity).
- C. Scheduling. See Paragraph 2.3.D.4 (View and Adjust Operating Schedules). System shall provide the following schedule options as a minimum:
 - 1. Weekly. Provide separate schedules for each day of the week. Each schedule shall be able to include up to 5 occupied periods (5 start-stop pairs or 10 events).
 - 2. Exception. Operator shall be able to designate an exception schedule for each of the next 365 days. After an exception schedule has executed, system shall discard and replace exception schedule with standard schedule for that day of the week.
 - 3. Holiday. Operator shall be able to define 24 special or holiday schedules of varying length on a scheduling calendar that repeats each year.
- D. System Coordination. Operator shall be able to group related equipment based on function and location and to use these groups for scheduling and other applications.
- E. Binary and Analog Alarms. See Paragraph 2.3.F.7 (Alarm Processing).
- F. Alarm Reporting. See Paragraph 2.3.F.9 (Alarm Reactions).
- G. Remote Communication. System shall automatically contact operator workstation or server on receipt of critical alarms. If no network connection is available, system shall use a modem connection.
- H. Demand Limiting.
 - 1. System shall monitor building power consumption from building power meter pulse generator signals or from building feeder line watt transducer or current transformer.
 - 2. When power consumption exceeds adjustable levels, system shall automatically adjust setpoints, de-energize low-priority equipment, and take other programmatic actions to reduce demand as specified in Section 15985 – Sequence of Operations for HVAC Controls. When demand drops below adjustable levels, system shall restore loads as specified.
- I. Maintenance Management. System shall generate maintenance alarms when equipment exceeds adjustable runtime, equipment starts, or performance limits. Configure and enable maintenance alarms as specified in Section 15985 – Sequence of Operations for HVAC Controls.
- J. Sequencing. Application software shall sequence chillers, boilers, and pumps as specified in Section 15985 – Sequence of Operations for HVAC Controls.
- K. PID Control. System shall provide direct- and reverse-acting PID (proportional-integral-derivative) algorithms. Each algorithm shall have anti-windup and selectable controlled variable, setpoint, and PID gains. Each algorithm shall calculate a time-varying analog value that can be used to position an output or to stage a series of outputs.
- L. Staggered Start. System shall stagger controlled equipment restart after power outage. Operator shall be able to adjust equipment restart order and time delay between equipment restarts.
- M. Energy Calculations.
 - 1. System shall accumulate and convert instantaneous power (kW) or flow rates (L/s [gpm]) to energy usage data.
 - 2. System shall calculate a sliding-window average (rolling average). Operator shall be able to adjust window interval to 15 minutes, 30 minutes, or 60 minutes.
- N. Anti-Short Cycling. Binary output objects shall be protected from short cycling by means of adjustable minimum on-time and off-time settings.

- O. On and Off Control with Differential. System shall provide direct- and reverse-acting on and off algorithms with adjustable differential to cycle a binary output based on a controlled variable and setpoint.
- P. Runtime Totalization. System shall provide an algorithm that can totalize runtime for each binary input and output. Operator shall be able to enable runtime alarm based on exceeded adjustable runtime limit. Configure and enable runtime totalization and alarms as specified in Section 15985 – Sequence of Operations for HVAC Controls.

2.5 Controllers

A. General. Provide Building Controllers (BC), Advanced Application Controllers (AAC), Application Specific Controllers (ASC), Smart Actuators (SA), and Smart Sensors (SS) as required to achieve performance specified in Section 15900 Article 1.9 (System Performance). Every device in the system which executes control logic and directly controls HVAC equipment must conform to a standard BACnet Device profile as specified in ANSI/ASHRAE 135-2004, BACnet Annex L. Unless otherwise specified, hardwired actuators and sensors may be used in lieu of BACnet Smart Actuators and Smart Sensors.

B. BACnet.

1. Building Controllers (BCs). Each BC shall conform to BACnet Building Controller (B-BC) device profile as specified in ANSI/ASHRAE 135-2004, BACnet Annex L and shall be listed as a certified B-BC in the BACnet Testing Laboratories (BTL) Product Listing.
2. Advanced Application Controllers (AACs). Each AAC shall conform to BACnet Advanced Application Controller (B-AAC) device profile as specified in ANSI/ASHRAE 135-2004, BACnet Annex L and shall be listed as a certified B-AAC in the BACnet Testing Laboratories (BTL) Product Listing.
3. Application Specific Controllers (ASCs). Each ASC shall conform to BACnet Application Specific Controller (B-ASC) device profile as specified in ANSI/ASHRAE 135-2004, BACnet Annex L and shall be listed as a certified B-ASC in the BACnet Testing Laboratories (BTL) Product Listing.
4. Smart Actuators (SAs). Each SA shall conform to BACnet Smart Actuator (B-SA) device profile as specified in ANSI/ASHRAE 135-2004, BACnet Annex L and shall be listed as a certified B-SA in the BACnet Testing Laboratories (BTL) Product Listing.
5. Smart Sensors (SSs). Each SS shall conform to BACnet Smart Sensor (B-SS) device profile as specified in ANSI/ASHRAE 135-2004, BACnet Annex L and shall be listed as a certified B-SS in the BACnet Testing Laboratories (BTL) Product Listing.
6. BACnet Communication.
 - a. Each BC shall reside on or be connected to a BACnet network using ISO 8802-3 (Ethernet) Data Link/Physical layer protocol and BACnet/IP addressing.
 - b. BACnet routing shall be performed by BCs or other BACnet device routers as necessary to connect BCs to networks of AACs and ASCs.
 - c. Each AAC shall reside on a BACnet network using ISO 8802-3 (Ethernet) Data Link/Physical layer protocol with BACnet/IP addressing, or it shall reside on a BACnet network using the ARCNET or MS/TP Data Link/Physical layer protocol.
 - d. Each ASC shall reside on a BACnet network using the ARCNET or MS/TP Data Link/Physical layer protocol.
 - e. Each SA shall reside on a BACnet network using the ARCNET or MS/TP Data Link/Physical layer protocol.
 - f. Each SS shall reside on a BACnet network using ISO 8802-3 (Ethernet) Data Link/Physical layer protocol with BACnet/IP addressing, or it shall reside on a BACnet network using ARCNET or MS/TP Data Link/Physical layer protocol.

C. Communication.

1. Service Port. Each controller shall provide a service communication port for connection to a Portable Operator's Terminal. Connection shall be extended to space temperature sensor ports where shown on drawings.

2. **Signal Management.** BC and ASC operating systems shall manage input and output communication signals to allow distributed controllers to share real and virtual object information and to allow for central monitoring and alarms.
 3. **Data Sharing.** Each BC and AAC shall share data as required with each networked BC and AAC.
 4. **Stand-Alone Operation.** Each piece of equipment specified in Section 15985 shall be controlled by a single controller to provide stand-alone control in the event of communication failure. All I/O points specified for a piece of equipment shall be integral to its controller. Provide stable and reliable stand-alone control using default values or other method for values normally read over the network.
- D. **Environment.** Controller hardware shall be suitable for anticipated ambient conditions.
1. Controllers used outdoors or in wet ambient conditions shall be mounted in waterproof enclosures and shall be rated for operation at -29°C to 60°C (-20°F to 140°F).
 2. Controllers used in conditioned space shall be mounted in dust-protective enclosures and shall be rated for operation at 0°C to 50°C (32°F to 120°F).
- E. **Keypad.** Provide a local keypad and display for each BC and AAC. Operator shall be able to use keypad to view and edit data. Keypad and display shall require password to prevent unauthorized use. If the manufacturer does not normally provide a keypad and display for each BC and AAC, provide the software and any interface cabling needed to use a laptop computer as a Portable Operator's Terminal for the system.
- F. **Real-Time Clock.** Controllers that perform scheduling shall have a real-time clock.
- G. **Serviceability.**
1. Controllers shall have diagnostic LEDs for power, communication, and processor.
 2. Wires shall be connected to a field-removable modular terminal strip or to a termination card connected by a ribbon cable.
 3. Each BC and AAC shall continually check its processor and memory circuit status and shall generate an alarm on abnormal operation. System shall continuously check controller network and generate alarm for each controller that fails to respond.
- H. **Memory.**
1. Controller memory shall support operating system, database, and programming requirements.
 2. Each BC and AAC shall retain BIOS and application programming for at least 72 hours in the event of power loss.
 3. Each ASC and SA shall use nonvolatile memory and shall retain BIOS and application programming in the event of power loss. System shall automatically download dynamic control parameters following power loss.
- I. **Immunity to Power and Noise.** Controllers shall be able to operate at 90% to 110% of nominal voltage rating and shall perform an orderly shutdown below 80% nominal voltage. Operation shall be protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 1 m (3 ft).
- J. **Transformer.** ASC power supply shall be fused or current limiting and shall be rated at a minimum of 125% of ASC power consumption.

2.6 Input and Output Interface

- A. **General.** Hard-wire input and output points to BCs, AACs, ASCs, or SAs.
- B. **Protection.** Shorting an input or output point to itself, to another point, or to ground shall cause no controller damage. Input or output point contact with up to 24 V for any duration shall cause no controller damage.
- C. **Binary Inputs.** Binary inputs shall monitor the on and off signal from a remote device. Binary inputs shall provide a wetting current of at least 12 mA and shall be protected against contact bounce and noise. Binary inputs shall sense dry contact closure without application of power external to the controller.
- D. **Pulse Accumulation Inputs.** Pulse accumulation inputs shall conform to binary input requirements and shall accumulate up to 10 pulses per second.

- E. Analog Inputs. Analog inputs shall monitor low-voltage (0-10 Vdc), current (4-20 mA), or resistance (thermistor or RTD) signals. Analog inputs shall be compatible with and field configurable to commonly available sensing devices.
- F. Binary Outputs. Binary outputs shall send an on-or-off signal for on and off control. Building Controller binary outputs shall have three-position (on-off-auto) override switches and status lights. Outputs shall be selectable for normally open or normally closed operation.
- G. Analog Outputs. Analog outputs shall send a modulating 0-10 Vdc or 4-20 mA signal as required to properly control output devices. Each Building Controller analog output shall have a two-position (auto-manual) switch, a manually adjustable potentiometer, and status lights. Analog outputs shall not drift more than 0.4% of range annually.
- H. Tri-State Outputs. Control three-point floating electronic actuators without feedback with tri-state outputs (two coordinated binary outputs). Tri-State outputs may be used to provide analog output control in zone control and terminal unit control applications such as VAV terminal units, duct-mounted heating coils, and zone dampers.
- I. Universal Inputs and Outputs. Inputs and outputs that can be designated as either binary or analog in software shall conform to the provisions of this section that are appropriate for their designated use.

2.7 Power Supplies And Line Filtering

- A. Power Supplies. Control transformers shall be UL listed. Furnish Class 2 current-limiting type or furnish over-current protection in primary and secondary circuits for Class 2 service in accordance with NEC requirements. Limit connected loads to 80% of rated capacity.
 - 1. DC power supply output shall match output current and voltage requirements. Unit shall be full-wave rectifier type with output ripple of 5.0 mV maximum peak-to-peak. Regulation shall be 1.0% line and load combined, with 100-microsecond response time for 50% load changes. Unit shall have built-in over-voltage and over-current protection and shall be able to withstand 150% current overload for at least three seconds without trip-out or failure.
 - a. Unit shall operate between 0°C and 50°C (32°F and 120°F). EM/RF shall meet FCC Class B and VDE 0871 for Class B and MILSTD 810C for shock and vibration.
 - b. Line voltage units shall be UL recognized and CSA listed.
- B. Power Line Filtering.
 - 1. Provide internal or external transient voltage and surge suppression for workstations and controllers. Surge protection shall have:
 - b. Dielectric strength of 1000 V minimum
 - c. Response time of 10 nanoseconds or less
 - d. Transverse mode noise attenuation of 65 dB or greater
 - e. Common mode noise attenuation of 150 dB or greater at 40-100 Hz

2.8 Auxiliary Control Devices

- A. Motorized Control Dampers.
 - 1. Type. Control dampers shall have linear flow characteristics and shall be parallel- or opposed-blade type as specified below or as scheduled on drawings.
 - a. Outdoor and return air mixing dampers and face-and-bypass dampers shall be parallel-blade and shall direct airstreams toward each other.
 - b. Other modulating dampers shall be opposed-blade.
 - c. Two-position shutoff dampers shall be parallel- or opposed-blade with blade and side seals.
 - 2. Frame. Damper frames shall be 2.38 mm (13 gauge) galvanized steel channel or 3.175 mm (1/8 in.) extruded aluminum with reinforced corner bracing.
 - 3. Blades. Damper blades shall not exceed 20 cm (8 in.) in width or 125 cm (48 in.) in length. Blades shall be suitable for medium velocity (10 m/s [2000 fpm]) performance. Blades shall be not less than 1.5875 mm (16 gauge).

4. **Shaft Bearings.** Damper shaft bearings shall be as recommended by manufacturer for application, oil impregnated sintered bronze, or better.
5. **Seals.** Blade edges and frame top and bottom shall have replaceable seals of butyl rubber or neoprene. Side seals shall be spring-loaded stainless steel. Blade seals shall leak no more than $50 \text{ L/s}\cdot\text{m}^2$ (10 cfm per ft^2) at 1000 Pa (4 in. w.g.) differential pressure. Blades shall be airfoil type suitable for wide-open face velocity of 7.5 m/s (1500 fpm).
6. **Sections.** Damper sections shall not exceed 125 cm - 150 cm (48 in. - 60 in.). Each section shall have at least one damper actuator.
7. **Linkages.** Dampers shall have exposed linkages.

B. Electric Damper and Valve Actuators.

1. **Stall Protection.** Mechanical or electronic stall protection shall prevent actuator damage throughout the actuator's rotation.
2. **Spring-return Mechanism.** Actuators used for power-failure and safety applications shall have an internal mechanical spring-return mechanism or an uninterruptible power supply (UPS).
3. **Signal and Range.** Proportional actuators shall accept a 0-10 Vdc or a 0-20 mA control signal and shall have a 2-10 Vdc or 4-20 mA operating range. (Floating motor actuators may be substituted for proportional actuators in terminal unit applications as described in paragraph 2.6H.)
4. **Wiring.** 24 Vac and 24 Vdc actuators shall operate on Class 2 wiring.
5. **Manual Positioning.** Operators shall be able to manually position each actuator when the actuator is not powered. Non-spring-return actuators shall have an external manual gear release. Spring-return actuators with more than 7 N·m (60 in.-lb) torque capacity shall have a manual crank.

C. Control Valves.

1. **General.** Select body and trim materials in accordance with manufacturer's recommendations for design conditions and service shown.
2. **Type.** Provide two- or three-way control valves for two-position or modulating service as shown.
3. **Water Valves.**
 - a. Valves providing two-position service shall be quick opening. Two-way valves shall have replaceable disc or ball.
 - b. **Close-off (Differential) Pressure Rating.** Valve actuator and trim shall provide the following minimum close-off pressure ratings.
 - i. Two-way: 150% of total system (pump) head.
 - ii. Three-way: 300% of pressure differential between ports A and B at design flow or 100% of total system (pump) head.
 - c. **Ports.** Valves providing modulating service shall have equal percentage ports.
 - d. **Sizing.**
 - i. Two-position service: line size.
 - ii. Two-way modulating service: select pressure drop equal to the greatest of twice the pressure drop through heat exchanger (load), 50% of the pressure difference between supply and return mains, or 35 kPa (5 psi).
 - iii. Three-way modulating service: select pressure drop equal to the smaller of twice the pressure drop through the coil exchanger (load) or 35 kPa (5 psi).
 - e. **Fail Position.** Water valves shall fail normally open or closed as follows unless otherwise specified.
 - i. Water zone valves: normally open.
 - ii. Heating coils in air handlers: normally open.
 - iii. Chilled water control valves: normally closed.

iv. Other applications: as scheduled or as required by sequences of operation.

4. Steam Valves.

- a. Close-off (Differential) Pressure Rating. Valve actuator and trim shall provide minimum close-off pressure rating equal to 150% of operating (inlet) pressure.
- b. Ports. Valves providing modulating service shall have linear ports.
- c. Sizing.
 - i. Two-position service: select pressure drop equal to 10%-20% of inlet psig.
 - ii. Modulating service at 100 kPa (15 psig) or less: select pressure drop equal to 80% of inlet psig.
 - iii. Modulating service at 101-350 kPa (16-50 psig): select pressure drop equal to 50% of inlet psig.
 - iv. Modulating service at over 350 kPa (50 psig): select pressure drop as scheduled on drawings.

D. Binary Temperature Devices.

1. Low-Voltage Space Thermostats. Low-voltage space thermostats shall be 24 V, bimetal-operated, mercury-switch type, with adjustable or fixed anticipation heater, concealed setpoint adjustment, 13°C-30°C (55°F-85°F) setpoint range, 1°C (2°F) maximum differential, and vented ABS plastic cover.
2. Line-Voltage Space Thermostats. Line-voltage space thermostats shall be bimetal-actuated, open-contact type or bellows-actuated, enclosed, snap-switch type or equivalent solid-state type, with heat anticipator, UL listing for electrical rating, concealed setpoint adjustment, 13°C-30°C (55°F-85°F) setpoint range, 1°C (2°F) maximum differential, and vented ABS plastic cover.
3. Low-Limit Thermostats. Low-limit airstream thermostats shall be UL listed, vapor pressure type. Element shall be at least 6 m (20 ft) long. Element shall sense temperature in each 30 cm (1 ft) section and shall respond to lowest sensed temperature. Low-limit thermostat shall be manual reset only.

E. Temperature Sensors.

1. Type. Temperature sensors shall be Resistance Temperature Device (RTD) or thermistor.
2. Duct Sensors. Duct sensors shall be single point or averaging as shown. Averaging sensors shall be a minimum of 1.5 m (5 ft) in length per 1 m² (10 ft²) of duct cross-section.
3. Immersion Sensors. Provide immersion sensors with a separable stainless steel well. Well pressure rating shall be consistent with system pressure it will be immersed in. Well shall withstand pipe design flow velocities.
4. Space Sensors. Space sensors shall have setpoint adjustment, override switch, display, and communication port as shown.
5. Differential Sensors. Provide matched sensors for differential temperature measurement.

F. Humidity Sensors.

1. Duct and room sensors shall have a sensing range of 20%-80%.
2. Duct sensors shall have a sampling chamber.
3. Outdoor air humidity sensors shall have a sensing range of 20%-95% RH and shall be suitable for ambient conditions of 40°C-75°C (40°F-170°F).
4. Humidity sensors shall not drift more than 1% of full scale annually.

G. Flow Switches. Flow-proving switches shall be paddle (water service only) or differential pressure type (air or water service) as shown. Switches shall be UL listed, SPDT snap-acting, and pilot duty rated (125 VA minimum).

1. Paddle switches shall have adjustable sensitivity and NEMA 1 enclosure unless otherwise specified.
2. Differential pressure switches shall have scale range and differential suitable for intended application and NEMA 1 enclosure unless otherwise specified.

H. Relays.

1. Control Relays. Control relays shall be plug-in type, UL listed, and shall have dust cover and LED "energized" indicator. Contact rating, configuration, and coil voltage shall be suitable for application.
2. Time Delay Relays. Time delay relays shall be solid-state plug-in type, UL listed, and shall have adjustable time delay. Delay shall be adjustable $\pm 100\%$ from setpoint shown. Contact rating, configuration, and coil voltage shall be suitable for application. Provide NEMA 1 enclosure for relays not installed in local control panel.

I. Override Timers.

1. Unless implemented in control software, override timers shall be spring-wound line voltage, UL Listed, with contact rating and configuration required by application. Provide 0-6 hour calibrated dial unless otherwise specified. Flush mount timer on local control panel face or where shown.

J. Current Transmitters.

1. AC current transmitters shall be self-powered, combination split-core current transformer type with built-in rectifier and high-gain servo amplifier with 4-20 mA two-wire output. Full-scale unit ranges shall be 10 A, 20 A, 50 A, 100 A, 150 A, and 200 A, with internal zero and span adjustment. Unit accuracy shall be $\pm 1\%$ full-scale at 500 ohm maximum burden.
2. Transmitter shall meet or exceed ANSI/ISA S50.1 requirements and shall be UL/CSA recognized.
3. Unit shall be split-core type for clamp-on installation on existing wiring.

K. Current Transformers.

1. AC current transformers shall be UL/CSA recognized and shall be completely encased (except for terminals) in approved plastic material.
2. Transformers shall be available in various current ratios and shall be selected for $\pm 1\%$ accuracy at 5 A full-scale output.
3. Use fixed-core transformers for new wiring installation and split-core transformers for existing wiring installation.

L. Voltage Transmitters.

1. AC voltage transmitters shall be self-powered single-loop (two-wire) type, 4-20 mA output with zero and span adjustment.
2. Adjustable full-scale unit ranges shall be 100-130 Vac, 200-250 Vac, 250-330 Vac, and 400-600 Vac. Unit accuracy shall be $\pm 1\%$ full-scale at 500 ohm maximum burden.
3. Transmitters shall meet or exceed ANSI/ISA S50.1 requirements and shall be UL/CSA recognized at 600 Vac rating.

M. Voltage Transformers.

1. AC voltage transformers shall be UL/CSA recognized, 600 Vac rated, and shall have built-in fuse protection.
2. Transformers shall be suitable for ambient temperatures of 4°C - 55°C (40°F - 130°F) and shall provide $\pm 0.5\%$ accuracy at 24 Vac and 5 VA load.
3. Windings (except for terminals) shall be completely enclosed with metal or plastic.

N. Power Monitors.

1. Power monitors shall be three-phase type and shall have three-phase disconnect and shorting switch assembly, UL listed voltage transformers, and UL listed split-core current transformers.
2. Power monitors shall provide selectable output: rate pulse for kWh reading or 4-20 mA for kW reading. Power monitors shall operate with 5 A current inputs and maximum error of $\pm 2\%$ at 1.0 power factor or $\pm 2.5\%$ at 0.5 power factor.

O. Current Switches.

1. Current-operated switches shall be self-powered, solid-state with adjustable trip current. Select switches to match application current and DDC system output requirements.

P. Pressure Transducers.

1. Transducers shall have linear output signal and field-adjustable zero and span.
2. Continuous operating conditions of positive or negative pressure 50% greater than calibrated span shall not damage transducer sensing elements.
3. Water pressure transducer diaphragm shall be stainless steel with minimum proof pressure of 1000 kPa (150 psi). Transducer shall have 4-20 mA output, suitable mounting provisions, and block and bleed valves.
4. Water differential pressure transducer diaphragm shall be stainless steel with minimum proof pressure of 1000 kPa (150 psi). Over-range limit (differential pressure) and maximum static pressure shall be 2000 kPa (300 psi.) Transducer shall have 4-20 mA output, suitable mounting provisions, and 5-valve manifold.

Q. Differential Pressure Switches. Differential pressure switches (air or water service) shall be UL listed, SPDT snap-acting, pilot duty rated (125 VA minimum) and shall have scale range and differential suitable for intended application and NEMA 1 enclosure unless otherwise specified.

R. Pressure-Electric (PE) Switches. PE switches shall be UL listed, pilot duty rated (125 VA minimum) or motor control rated, metal or neoprene diaphragm actuated, operating pressure rated for 0-175 kPa (0-25 psig), with calibrated scale minimum setpoint range of 14-125 kPa (2-18 psig).

1. Provide one- or two-stage switch action (SPDT, DPST, or DPDT) as required by application.
2. Switches shall be open type (panel-mounted). Exception: Switches shall be enclosed type for remote installation. Enclosed type shall be NEMA 1 unless otherwise specified.
3. Each pneumatic signal line to PE switches shall have permanent indicating gauge.

S. Local Control Panels.

1. Indoor control panels shall be fully enclosed NEMA 1 construction with hinged door key-lock latch and removable sub-panels. A common key shall open each control panel and sub-panel.
2. Prewire internal and face-mounted device connections with color-coded stranded conductors tie-wrapped or neatly installed in plastic troughs. Field connection terminals shall be UL listed for 600 V service, individually identified per control and interlock drawings, with adequate clearance for field wiring.
3. Each local panel shall have a control power source power switch (on-off) with overcurrent protection.

2.9 Wiring And Raceways

- A. General. Provide copper wiring, plenum cable, and raceways as specified in applicable sections of Division 26.
- B. Insulated wire shall use copper conductors and shall be UL listed for 90°C (200°F) minimum service.

2.10 Fiber Optic Cable System

- A. Optical Cable. Optical cables shall be duplex 900 mm tight-buffer construction designed for intra-building environments. Sheath shall be UL listed OFNP in accordance with NEC Article 770. Optical fiber shall meet the requirements of FDDI, ANSI X3T9.5 PMD for 62.5/125mm.
- B. Connectors. Field terminate optical fibers with ST type connectors. Connectors shall have ceramic ferrules and metal bayonet latching bodies.

PART 3- EXECUTION

3.1 Examination

- A. Thoroughly examine project plans for control device and equipment locations. Report discrepancies, conflicts, or omissions to Commissioner for resolution before starting rough-in work.
- B. Inspect site to verify that equipment can be installed as shown. Report discrepancies, conflicts, or omissions to Commissioner for resolution before starting rough-in work.
- C. Examine drawings and specifications for work of others. Report inadequate headroom or space conditions or other discrepancies to Commissioner and obtain written instructions for changes necessary to accommodate Section 15900 work with work of others. Controls Contractor shall perform at his expense necessary changes in specified work caused by failure or neglect to report discrepancies.

3.2 Protection

- A. Controls Contractor shall protect against and be liable for damage to work and to material caused by Contractor's work or employees.
- B. Controls Contractor shall be responsible for work and equipment until inspected, tested, and accepted. Protect material not immediately installed. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of foreign objects.

3.3 Coordination

- A. Site.
 1. Assist in coordinating space conditions to accommodate the work of each trade where work will be installed near or will interfere with work of other trades. If installation without coordination causes interference with work of other trades, Contractor shall correct conditions without extra charge.
 2. Coordinate and schedule work with other work in the same area and with work dependent upon other work to facilitate mutual progress.
- B. Submittals. See Section 15900 Article 1.10 (Submittals).
- C. Test and Balance.
 1. Provide Test and Balance Contractor a single set of necessary tools to interface to control system for testing and balancing.
 2. Train Test and Balance Contractor to use control system interface tools.
 3. Provide a qualified technician to assist with testing and balancing the first 20 terminal units.
 4. Test and Balance Contractor shall return tools undamaged and in working condition at completion of testing and balancing.
- D. Life Safety.
 1. Duct smoke detectors required for air handler shutdown are provided under Division 15. Interlock smoke detectors to air handlers for shutdown as specified in Section 15985 – Sequence of Operations for HVAC Controls.
 2. Smoke dampers and actuators required for duct smoke isolation are provided under Division 15. Interlock smoke dampers to air handlers as specified in Section 15985 – Sequence of Operations for HVAC Controls.
 3. Fire and smoke dampers and actuators required for fire-rated walls are provided under Division 15. Fire and smoke damper control is provided under Division 28.
- E. Coordination with Other Controls. Integrate with and coordinate controls and control devices furnished or installed by others as follows.
 1. Communication media and equipment shall be provided as specified in Section 15900 Article 2.2 (Communication).

2. Each supplier of a controls product shall configure, program, start up, and test that product to meet the sequences of operation described in Section 15985 Appendix A regardless of where within the contract documents those products are described.
3. Coordinate and resolve incompatibility issues that arise between control products provided under this section and those provided under other sections or divisions of this specification.
4. Controls Contractor shall be responsible for integration of control products provided by multiple suppliers regardless of where integration is described within the contract documents.

3.4 General Workmanship

- A. Install equipment, piping, and wiring or raceway horizontally, vertically, and parallel to walls wherever possible.
- B. Provide sufficient slack and flexible connections to allow for piping and equipment vibration isolation.
- C. Install equipment in readily accessible locations as defined by National Electrical Code (NEC) Chapter 1 Article 100 Part A.
- D. Verify wiring integrity to ensure continuity and freedom from shorts and ground faults.
- E. Equipment, installation, and wiring shall comply with industry specifications and standards and local codes for performance, reliability, and compatibility.

3.5 Field Quality Control

- A. Work, materials, and equipment shall comply with rules and regulations of applicable local, state, and federal codes and ordinances as identified in Section 15900 Article 1.8 (Codes and Standards).
- B. Continually monitor field installation for code compliance and workmanship quality.
- C. Contractor shall arrange for work inspection by local or state authorities having jurisdiction over the work.

3.6 Wiring

- A. Control and interlock wiring and installation shall comply with national and local electrical codes, Division 16, and manufacturer's recommendations. Where the requirements of Section 15900 differ from Division 16 Section 15900 shall take precedence.
- B. NEC Class 1 (line voltage) wiring shall be UL listed in approved raceway as specified by NEC and Division 16.
- C. Low-voltage wiring shall meet NEC Class 2 requirements. Subfuse low-voltage power circuits as required to meet Class 2 current limit.
- D. NEC Class 2 (current-limited) wires not in raceway but in concealed and accessible locations such as return air plenums shall be UL listed for the intended application.
- E. Install wiring in raceway where subject to mechanical damage and at levels below 3 m (10ft) in mechanical, electrical, or service rooms.
- F. Install Class 1 and Class 2 wiring in separate raceways. Boxes and panels containing high-voltage wiring and equipment shall not be used for low-voltage wiring except for the purpose of interfacing the two through relays and transformers.
- G. Do not install wiring in raceway containing tubing.
- H. Run exposed Class 2 wiring parallel to a surface or perpendicular to it and tie neatly at 3 m (10 ft) intervals.
- I. Use structural members to support or anchor plenum cables without raceway. Do not use ductwork, electrical raceways, piping, or ceiling suspension systems to support or anchor cables.
- J. Secure raceways with raceway clamps fastened to structure and spaced according to code requirements. Raceways and pull boxes shall not be hung on or attached to ductwork, electrical raceways, piping, or ceiling suspension systems.
- K. Size raceway and select wire size and type in accordance with manufacturer's recommendations and NEC requirements.
- L. Include one pull string in each raceway 2.5 cm (1 in.) or larger.
- M. Use color-coded conductors throughout.

- N. Locate control and status relays in designated enclosures only. Do not install control and status relays in packaged equipment control panel enclosures containing Class 1 starters.
- O. Conceal raceways except within mechanical, electrical, or service rooms. Maintain minimum clearance of 15 cm (6 in.) between raceway and high-temperature equipment such as steam pipes or flues.
- P. Adhere to requirements in Division 16 where raceway crosses building expansion joints.
- Q. Install insulated bushings on raceway ends and enclosure openings. Seal top ends of vertical raceways.
- R. Terminate control and interlock wiring related to the work of this section. Maintain at the job site updated (as-built) wiring diagrams that identify terminations.
- S. Flexible metal raceways and liquid-tight flexible metal raceways shall not exceed 1 m (3 ft) in length and shall be supported at each end. Do not use flexible metal raceway less than ½ in. electrical trade size. Use liquid-tight flexible metal raceways in areas exposed to moisture including chiller and boiler rooms.
- T. Install raceway rigidly, support adequately, ream at both ends, and leave clean and free of obstructions. Join raceway sections with couplings and according to code. Make terminations in boxes with fittings. Make terminations not in boxes with bushings.
- U. Wiring shall be installed as follows:
 - A. In EMT in MERs
 - B. In plenum rated cable in ceilings and walls
 - C. In RGS outdoors

3.7 Communication Wiring

- A. Communication wiring shall be low-voltage Class 2 wiring and shall comply with Article 3.7 (Wiring).
- B. Install communication wiring in separate raceways and enclosures from other Class 2 wiring.
- C. During installation do not exceed maximum cable pulling, tension, or bend radius specified by the cable manufacturer.
- D. Verify entire network's integrity following cable installation using appropriate tests for each cable.
- E. Install lightning arrestor according to manufacturer's recommendations between cable and ground where a cable enters or exits a building.
- F. Each run of communication wiring shall be a continuous length without splices when that length is commercially available. Runs longer than commercially available lengths shall have as few splices as possible using commercially available lengths.
- G. Label communication wiring to indicate origination and destination.
- H. Ground coaxial cable according to NEC regulations article on "Communications Circuits, Cable, and Protector Grounding."

3.8 Fiber Optic Cable

- A. During installation do not exceed maximum pulling tensions specified by cable manufacturer. Post-installation residual cable tension shall be within cable manufacturer's specifications.
- B. Install cabling and associated components according to manufacturers' instructions. Do not exceed minimum cable and unjacketed fiber bend radii specified by cable manufacturer.

3.9 Installation of Sensors

- A. Install sensors according to manufacturer's recommendations.
- B. Mount sensors rigidly and adequately for operating environment.
- C. Install room temperature sensors on concealed junction boxes properly supported by wall framing.
- D. Air seal wires attached to sensors in their raceways or in the wall to prevent sensor readings from being affected by air transmitted from other areas.
- E. Use averaging sensors in mixing plenums and hot and cold decks. Install averaging sensors in a serpentine manner vertically across duct. Support each bend with a capillary clip.

- F. Install mixing plenum low-limit sensors in a serpentine manner horizontally across duct. Support each bend with a capillary clip. Provide 3 m (1 ft) of sensing element for each 1 m² (1 ft²) of coil area.
- G. Install pipe-mounted temperature sensors in wells. Install liquid temperature sensors with heat-conducting fluid in thermal wells.
- H. Install outdoor air temperature sensors on north wall at designated location with sun shield.
- I. Differential Air Static Pressure.
 - 1. Supply Duct Static Pressure. Pipe high-pressure tap to duct using a pitot tube. Make pressure tap connections according to manufacturer's recommendations.
 - 2. Return Duct Static Pressure. Pipe high-pressure tap to duct using a pitot tube. Make pressure tap connections according to manufacturer's recommendations.
 - 3. Building Static Pressure. Pipe pressure sensor's low-pressure port to the static pressure port located on the outside of the building through a high-volume accumulator. Pipe high-pressure port to a location behind a thermostat cover.
 - 4. Piping to pressure transducer pressure ports shall contain a capped test port adjacent to transducer.
 - 5. Pressure transducers, except those controlling VAV boxes, shall be located in control panels, not on monitored equipment or on ductwork. Mount transducers in a vibration-free location accessible for service without use of ladders or special equipment.
 - 6. Mount gauge tees adjacent to air and water differential pressure taps. Install shut-off valves before tee for water gauges.
- J. Smoke detectors, freezestats, high-pressure cut-offs, and other safety switches shall be hard-wired to de-energize equipment as described in the sequence of operation. Switches shall require manual reset. Provide contacts that allow DDC software to monitor safety switch status.

3.10 Flow Switch Installation

- A. Use correct paddle for pipe diameter.
- B. Adjust flow switch according to manufacturer's instructions.

3.11 Actuators

- A. General. Mount actuators and adapters according to manufacturer's recommendations.
- B. Electric and Electronic Damper Actuators. Mount actuators directly on damper shaft or jackshaft unless shown as a linkage installation. Link actuators according to manufacturer's recommendations.
 - 1. For low-leakage dampers with seals, mount actuator with a minimum 5° travel available for damper seal tightening.
 - 2. To compress seals when spring-return actuators are used on normally closed dampers, power actuator to approximately 5° open position, manually close the damper, then tighten linkage.
 - 3. Check operation of damper-actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.
 - 4. Provide necessary mounting hardware and linkages for actuator installation.
- C. Valve Actuators. Connect actuators to valves with adapters approved by actuator manufacturer.

3.12 Warning Labels

- A. Affix permanent warning labels to equipment that can be automatically started by the control system.

3.13 Identification of Hardware and Wiring

- A. Label wiring and cabling, including that within factory-fabricated panels, with termination number.
- B. Permanently label or code each point of field terminal strips to show instrument or item served.
- C. Label control panels with minimum 1 cm (½ in.) letters on laminated plastic nameplates.
- D. Label room sensors related to terminal boxes or valves with nameplates.

3.14 Programming

- A. **Point Naming.** Name points as shown on the equipment points list provided with each sequence of operation. See Section 15985 (Sequences of Operation). If character limitations or space restrictions make it advisable to shorten the name, the abbreviations given in Appendix B to Section 15985 may be used. Where multiple points with the same name reside in the same controller, each point name may be customized with its associated Program Object number. For example, "Zone Temp 1" for Zone 1, "Zone Temp 2" for Zone 2.
- B. **Software Programming.** Programming shall provide actions for each possible situation. Graphic- or parameter-based programs shall be documented. Text-based programs shall be modular, structured, and commented to clearly describe each section of the program.
 - 1. **Application Programming.** Provide application programming that adheres to sequences of operation specified in Section 15985. Program documentation or comment statements shall reflect language used in sequences of operation.
 - 2. **System Programming.** Provide system programming necessary for system operation.
- C. **Operator Interface.**
 - 1. **Standard Graphics.** Provide graphics as specified in Section 15900 Article 2.3 Paragraph E.2 (System Graphics). Show on each equipment graphic input and output points and relevant calculated points such as indicated on the applicable Points List in Section 15985. Point information on graphics shall dynamically update.
 - 2. **Install, initialize, start up, and troubleshoot operator interface software and functions (including operating system software, operator interface database, and third-party software installation and integration required for successful operator interface operation) as described in Section 15900.**

3.15 Control System Checkout and Testing

- A. **Startup Testing.** Complete startup testing to verify operational control system before notifying Owner of system demonstration. Provide City of New York with schedule for startup testing. The City of New York may have representative present during any or all startup testing.
 - 1. **Calibrate and prepare for service each instrument, control, and accessory equipment furnished under Section 15900.**
 - 2. **Verify that control wiring is properly connected and free of shorts and ground faults. Verify that terminations are tight.**
 - 3. **Enable control systems and verify each input device's calibration. Calibrate each device according to manufacturer's recommendations.**
 - 4. **Verify that binary output devices such as relays, solenoid valves, two-position actuators and control valves, and magnetic starters, operate properly and that normal positions are correct.**
 - 5. **Verify that analog output devices such as I/Ps and actuators are functional, that start and span are correct, and that direction and normal positions are correct. Check control valves and automatic dampers to ensure proper action and closure. Make necessary adjustments to valve stem and damper blade travel.**
 - 6. **Prepare a log documenting startup testing of each input and output device, with technician's initials certifying each device has been tested and calibrated.**
 - 7. **Verify that system operates according to sequences of operation. Simulate and observe each operational mode by overriding and varying inputs and schedules. Tune PID loops and each control routine that requires tuning.**
 - 8. **Alarms and Interlocks.**
 - a. **Check each alarm with an appropriate signal at a value that will trip the alarm.**
 - b. **Trip interlocks using field contacts to check logic and to ensure that actuators fail in the proper direction.**
 - c. **Test interlock actions by simulating alarm conditions to check initiating value of variable and interlock action.**

3.16 Control System Demonstration and Acceptance

A. Demonstration. Prior to acceptance, perform the following performance tests to demonstrate system operation and compliance with specification after and in addition to tests specified in Article 3.17 (Control System Checkout and Testing). Provide Commissioner with log documenting completion of startup tests.

1. Commissioner will be present to observe and review system demonstration. Notify Commissioner at least 10 days before system demonstration begins.
2. Demonstration shall follow process submitted and approved under Section 15900 Article 1.10 (Submittals). Complete approved checklists and forms for each system as part of system demonstration.
3. Demonstrate actual field operation of each sequence of operation as specified in Section 15985. Provide at least two persons equipped with two-way communication. Demonstrate calibration and response of any input and output points requested by Commissioner. Provide and operate test equipment required to prove proper system operation.
4. Demonstrate compliance with Section 15900 Part 1 (System Performance).
5. Demonstrate compliance with sequences of operation through each operational mode.
6. Demonstrate complete operation of operator interface.
7. Demonstrate each of the following.
 - a. DDC loop response. Supply graphical trend data output showing each DDC loop's response to a setpoint change representing an actuator position change of at least 25% of full range. Trend sampling rate shall be from 10 seconds to 3 minutes, depending on loop speed. Each sample's trend data shall show setpoint, actuator position, and controlled variable values. Commissioner will require further tuning of each loop that displays unreasonably under- or over-damped control.
 - b. Demand limiting. Supply trend data output showing demand-limiting algorithm action. Trend data shall document action sampled each minute over at least a 30-minute period and shall show building kW, demand-limiting setpoint, and status of setpoints and other affected equipment parameters.
 - c. Building fire alarm system interface.
 - d. Trend logs for each system. Trend data shall indicate setpoints, operating points, valve positions, and other data as specified in the points list provided with each sequence of operation in Section 15985. Each log shall cover three 48-hour periods and shall have a sample frequency not less than 10 minutes or as specified on its points list. Logs shall be accessible through system's operator interface and shall be retrievable for use in other software programs as specified in Section 15900 Article 2.3 Paragraph E.11 (Trend Configuration).
8. Tests that fail to demonstrate proper system operation shall be repeated after Contractor makes necessary repairs or revisions to hardware or software to successfully complete each test.

B. Acceptance.

1. After tests described in this specification are performed to the satisfaction of both Commissioner and the City of New York, Commissioner will accept control system as meeting completion requirements. Commissioner may exempt tests from completion requirements that cannot be performed due to circumstances beyond Contractor's control. Commissioner will provide written statement of each exempted test. Exempted tests shall be performed as part of warranty.
2. System shall not be accepted until completed demonstration forms and checklists are submitted and approved as required in Section 15900 Article 1.10 (Submittals).

3.17 Cleaning

- A. Each day clean up debris resulting from work. Remove packaging material as soon as its contents have been removed. Collect waste and place in designated location.
- B. On completion of work in each area, clean work debris and equipment. Keep areas free from dust, dirt, and debris.
- C. On completion of work, check equipment furnished under this section for paint damage. Repair damaged factory-finished paint to match adjacent areas. Replace deformed cabinets and enclosures with new material and repaint to match adjacent areas.

3.18 Training

- A. Provide training for a designated staff of the Commissioner. Training shall be provided via self-paced training, web-based or computer-based training, classroom training, or a combination of training methods.
- B. Training shall enable students to accomplish the following objectives.
 - 1. Proficiently operate system
 - 2. Understand control system architecture and configuration
 - 3. Understand DDC system components
 - 4. Understand system operation, including DDC system control and optimizing routines (algorithms)
 - 5. Operate workstation and peripherals
 - 6. Log on and off system
 - 7. Access graphics, point reports, and logs
 - 8. Adjust and change system setpoints, time schedules, and holiday schedules
 - 9. Recognize common HVAC system malfunctions by observing system graphics, trend graphs, and other system tools
 - 10. Understand system drawings and Operation and Maintenance manual
 - 11. Understand job layout and location of control components
 - 12. Access data from DDC controllers
 - 13. Operate portable operator's terminals
 - 14. Create and change system graphics
 - 15. Create, delete, and modify alarms, including configuring alarm reactions
 - 16. Create, delete, and modify point trend logs (graphs) and multi-point trend graphs
 - 17. Configure and run reports
 - 18. Add, remove, and modify system's physical points
 - 19. Create, modify, and delete application programming
 - 20. Add operator interface stations
 - 21. Add a new controller to system
 - 22. Download firmware and advanced applications programming to a controller
 - 23. Configure and calibrate I/O points
 - 24. Maintain software and prepare backups
 - 25. Interface with job-specific, third-party operator software
 - 26. Add new users and understand password security procedures
- C. Provide course outline and materials according to Section 15900 Article 1.10 (Submittals). Provide one copy of training material per student.
- D. Instructors shall be factory-trained and experienced in presenting this material.

END OF SECTION 15900

SECTION 15910

DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDE

- A. Combination fire and smoke dampers.
- B. Duct access doors.
- C. Duct test holes.
- D. Fire dampers.
- E. Flexible duct connections.
- F. Volume control dampers.

1.02 RELATED SECTIONS

- A. Section 15245 - Vibration Isolation.
- B. Section 15890 - Ductwork.

1.03 REFERENCES

- A. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
- B. NFPA 92A - Smoke Control Systems.
- C. NFPA 70 - National Electrical Code.
- D. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- E. UL 33 - Heat Responsive Links for Fire-Protection Service.
- F. UL 555 - Fire Dampers.
- G. UL 555S - Leakage Rated Dampers for Use in Smoke Control Systems.

1.04 SUBMITTALS

- A. Submit under provisions of General Conditions.
- B. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers duct access doors and duct test holes.
- C. Product Data: Provide for shop fabricated assemblies including volume control dampers duct access doors duct test holes and hardware used. Include electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions: Indicate for fire dampers and combination fire and smoke dampers.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of General Conditions.
- B. Record actual locations of access doors test holes

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.07 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories Inc., testing firm acceptable to the Commissioner having jurisdiction as suitable for the purpose specified and indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of General Conditions.
- B. Protect dampers from damage to operating linkages and blades.

1.09 EXTRA MATERIALS

- A. Furnish under provisions of General Conditions.
- B. Provide two of each size and type of fusible link.

PART 2 - PRODUCTS

2.01 COMBINATION FIRE AND SMOKE DAMPERS

- A. Fabricate in accordance with NFPA 90A, UL 555, UL 555S, and as indicated.
- B. Provide factory sleeve and collar for each damper.
- C. Multiple Blade Dampers: Fabricate with 16 gage galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock, and 1/2 inch actuator shaft.
- D. Operators: UL listed and labelled spring return instrument air, electric type suitable for 120 volts, single phase, 60 Hz. Provide end switches to indicate damper position. Locate damper operator on exterior of duct and link to damper operating shaft.
- E. "LED" Indicators: Ceiling mount "LED" indicator to light when damper is in closed position.
- F. Where drawings indicate "FSD"s they refer to both combination fire and smoke dampers. "FSD"s shall be wired to open and close in response to an alarm condition initiated when a duct mounted smoke detector senses smoke and also in response to an alarm condition signal sent by the Fire Command Center. Interlock "FSD's" with their associated supply and return fans. All "FSD's" shall remain closed until the alarm condition is cleared at the Fire Command Center.

2.02 DUCT ACCESS DOORS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

- B. Fabrication: Rigid and close-fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one inch thick insulation with sheet metal cover.
1. Less Than 12 Inches Square: Secure with sash locks.
 2. Up to 18 Inches Square: Provide two hinges and two sash locks.
 3. Up to 24 x 48 Inches: Three hinges and two compression latches with outside and inside handles.
 4. Larger Sizes: Provide an additional hinge.
 5. Sash Lock
 6. Compression Latch
 7. Hinge
- C. Access doors with sheet metal screw fasteners are not acceptable.

2.03 DUCT TEST HOLES

- A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
- B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.04 FIRE DAMPERS

- A. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.
- B. Horizontal Dampers: Galvanized steel, 22 gage frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.
- C. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel for horizontal installations. Configure with blades out of air stream except for ducts up to 12 inches in height.
- D. Multiple Blade Dampers: 16 gage galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.
- E. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

2.05 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
- B. Connector: Fabric crimped into metal edging strip.
1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq yd.

2. Net Fabric Width: Approximately 23 6 inches wide.
 3. Metal: 3 inch wide, 24 gage galvanized steel.
- C. Leaded Vinyl Sheet: Minimum 0.55 inch thick, 0.87 lbs per sq ft. 10 dB attenuation in 10 to 10,000 Hz range.

2.06 VOLUME CONTROL DAMPERS.

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
- B. Splitter Dampers:
1. Material: Same gage as duct to 24 inches size in either direction, and two gages heavier for sizes over 24 inches.
 2. Blade: Fabricate of single thickness sheet metal to streamline shape, secured with continuous hinge or rod.
 3. Operator: Minimum 1/4 inch diameter rod in self aligning, universal joint action, flanged bushing with set screw.
- C. Single Blade Dampers: Fabricate for duct sizes up to 6 x 30 inch.
- D. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
- E. End Bearings: Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
- F. Quadrants:
1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
 2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
 3. Where rod lengths exceed 30 inches provide regulator at both ends.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 15890 for duct construction and pressure class.

- B. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated. Provide for cleaning kitchen exhaust ductwork in accordance with NFPA 96. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated. Review locations prior to fabrication.
- C. Provide duct test holes where indicated and required for testing and balancing purposes.
- D. Provide fire dampers, combination fire and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- E. Install fire dampers in accordance with NFPA 92A.
- F. Demonstrate re-setting of fire dampers to Commissioner.
- G. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment, and supported by vibration isolators.
- H. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.
- I. Use splitter dampers only where indicated.
- J. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION 15910

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SECTION 15940

AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Diffusers.
- B. Registers/grilles.
- C. Louvers.

1.02 REFERENCES

- A. ADC 1062 - Certification, Rating and Test Manual.
- B. AMCA 500 - Test Method for Louvers, Dampers and Shutters.
- C. ARI 650 - Air Outlets and Inlets.
- D. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.
- E. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
- F. NFPA 70 - National Electrical Code.
- G. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

1.03 SUBMITTALS

- A. Submit under provisions of Section 15010.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.04 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of General Conditions.
- B. Record actual locations of air outlets and inlets.

1.05 QUALITY ASSURANCE

- A. Test and rate air outlet and inlet performance in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.
- B. Test and rate louver performance in accordance with AMCA 500.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified:

Rugby Branch Library Renovation
LBKA05RUG

15940-1

Air Outlets and Inlets
(11-20-15)

1. Titus
 2. Anemostat
 3. Price.
 4. Or Approved Equal.
- B. Type: Square, multi-core diffuser to discharge air in 360 degree pattern with sectorizing baffles where indicated.
- C. Frame: Surface mount or Inverted T-bar Spline as required. In plaster ceilings, provide plaster frame and ceiling frame.
- D. Fabrication: Steel with baked enamel off-white finish.
- E. Accessories: Radial opposed blade damper and multi-louvered equalizing grid with damper adjustable from diffuser face.
- F. Linear Diffusers

2.02 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, vertical horizontal face.
- B. Frame: 1-1/4 one inch margin with countersunk screw.
- C. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, with factory off-white enamel finish.
- D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

2.03 WALL SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable blades, 3/4 inch minimum depth, 3/4 inch maximum spacing with spring or other device to set blades, vertical horizontal face, single double deflection.
- B. Frame: One inch margin with countersunk screw mounting and gasket.
- C. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, with factory off-white enamel.
- D. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face.

2.04 WALL EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch. Minimum depth, 3/4 inch maximum spacing, with spring or other device to set blades, horizontal face.
- B. Frame: One inch margin with countersunk screw mounting.
- C. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, with factory off-white enamel.
- D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.
- E. Gymnasiums: Provide front pivoted or welded in place blades, securely fastened to be immobile.

2.05 LOUVERS

- A. Type: 6 inch deep with blades on 45 degree slope with center baffle and return bend, heavy channel frame, birdscreen with 1/2 inch square mesh for exhaust and 3/4 inch for intake.
- B. Fabrication: 16 gage thick galvanized steel thick extruded aluminum, welded assembly, with factory anodized finish color to be selected.
- C. Mounting: Furnish with interior screw holes in jambs for installation.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black.

END OF SECTION 15940

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SECTION 15985

SEQUENCE OF OPERATION

PART 1 - GENERAL

1.1 Single Zone Unit (typical of 2)

- A. Interlock between A/C unit and Condenser
 - 1. The BMS contractor shall provide hardwire interlock between the A/C unit and the Roof mounted Air Cooled Condenser.

- B. Run Conditions - Scheduled:
 - 1. The unit shall run according to a user definable time schedule in the following modes:
 - a. Occupied Mode: The unit shall maintain
 - 1) A 74°F (adj.) cooling setpoint
 - 2) A 70°F (adj.) heating setpoint.

 - b. Unoccupied Mode (night setback): The unit shall maintain
 - 1) A 85°F (adj.) cooling setpoint.
 - 2) A 55°F (adj.) heating setpoint.

- C. Alarms shall be provided as follows:
 - a. High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.).
 - b. Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).
 - c. Leak Detected

- D. Zone Setpoint Adjust: The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.
 - a. Zone Optimal Start: The unit shall use an optimal start algorithm for morning start-up. This algorithm shall minimize the unoccupied warm-up or cool-down period while still achieving comfort conditions by the start of scheduled occupied period.

 - b. Zone Unoccupied Override: A timed local override control shall allow an occupant to override the schedule and place the unit into an occupied mode for an adjustable period of time. At the expiration of this time, control of the unit shall automatically return to the schedule.

- E. Freeze Protection: The unit shall shut down and generate an alarm upon receiving a freezestat status.

- F. Supply Fan:
 - 1. The supply fan shall run anytime the unit is commanded to run, unless shutdown on safeties. To prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime.

2. Alarms shall be provided as follows:
 - a. Supply Fan Failure: Commanded on, but the status is off.
 - b. Supply Fan in Hand: Commanded off, but the status is on.
 - c. Supply Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

G. Return Fan:

1. The return fan shall run whenever the supply fan runs.
2. Alarms shall be provided as follows:
 - a. Return Fan Failure: Commanded on, but the status is off.
 - b. Return Fan in Hand: Commanded off, but the status is on.
 - c. Return Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

H. Preheating Coil Valve:

1. The controller shall measure the mixed air temperature and modulate the preheating coil valve to maintain its setpoint 10°F (adj.) less than the zone heating setpoint.
2. The preheating shall be enabled whenever:
 - a. Outside air temperature is less than 55°F (adj.).
 - 1) AND the economizer (if present) is disabled.
 - 2) AND the heating is active.
 - 3) AND cooling is not active.
 - 4) AND the supply fan status is on.
3. The preheating coil valve shall open for freeze protection whenever:
 - b. Mixed air temperature drops from 40°F to 35°F (adj.).
 - c. OR the freezestat (if present) is on.

I. Cooling Stages:

1. The controller shall measure the zone temperature and stage the cooling to maintain its cooling setpoint. To prevent short cycling, there shall be a user definable (adj.) delay between stages, and each stage shall have a user definable (adj.) minimum runtime.
2. The cooling shall be enabled whenever:
 - a. Outside air temperature is greater than 60°F (adj.).
 - 1) AND the economizer (if present) is disabled or fully open.
 - 2) AND the zone temperature is above cooling setpoint.
 - 3) AND the supply fan status is on.
 - 4) AND the heating is not active.

J. Heating Coil Valve:

1. The controller shall measure the zone temperature and modulate the heating coil valve to maintain its heating setpoint.

2. The heating shall be enabled whenever:
 - a. Outside air temperature is less than 65°F (adj.).
 - 1) AND the zone temperature is below heating setpoint.
 - 2) AND the supply fan status is on.
 - 3) AND the cooling is not active.
3. The heating coil valve shall open whenever the freezestat (if present) is on.

K. Economizer:

1. The controller shall measure the zone temperature and modulate the economizer dampers in sequence to maintain a setpoint 2°F less than the zone cooling setpoint. The outside air dampers shall maintain a minimum adjustable position of 20% (adj.) open whenever occupied.
2. The economizer shall be enabled whenever:
 - a. Outside air temperature is less than 65°F (adj.).
 - 1) AND the outside air temperature is less than the return air temperature.
 - 2) AND the supply fan status is on.
3. The economizer shall close whenever:
 - a. Mixed air temperature drops from 45°F to 40°F (adj.).
 - 1) OR on loss of supply fan status.
 - 2) OR the freezestat (if present) is on.
4. The outside and exhaust air dampers shall close and the return air damper shall open when the unit is off.

L. Minimum Outside Air Ventilation - Fixed Percentage:

1. The outside air dampers shall maintain a minimum position (adj.) during building occupied hours and be closed during unoccupied hours.

M. Prefilter Status:

1. The controller shall monitor the prefilter status.
 - a. Alarms shall be provided as follows:
 - 1) Prefilter Change Required: Prefilter differential pressure exceeds a user definable limit (adj.).

N. Mixed Air Temperature:

1. The controller shall monitor the mixed air temperature and use as required for economizer control (if present) or preheating control (if present).
2. Alarms shall be provided as follows:
 - a. High Mixed Air Temp: If the mixed air temperature is greater than 90°F (adj.).
 - b. Low Mixed Air Temp: If the mixed air temperature is less than 45°F (adj.).

O. Return Air Carbon Dioxide (CO₂) Concentration Monitoring:

1. The controller shall measure the return air CO₂ levels.

2. Alarms shall be provided as follows:
 - a. High Return Air Carbon Dioxide Concentration: If the return air CO2 concentration is greater than 1000ppm (adj.) when in the occupied mode.
- P. Return Air Humidity:
1. The controller shall monitor the return air humidity and use as required for economizer control (if present) or humidity control (if present).
 2. Alarms shall be provided as follows:
 - a. High Return Air Humidity: If the return air humidity is greater than 70% (adj.).
 - b. Low Return Air Humidity: If the return air humidity is less than 35% (adj.).
- Q. Return Air Temperature:
1. The controller shall monitor the return air temperature and use as required for economizer control (if present).
 2. Alarms shall be provided as follows:
 - a. High Return Air Temp: If the return air temperature is greater than 90°F (adj.).
 - b. Low Return Air Temp: If the return air temperature is less than 45°F (adj.).
- R. Supply Air Temperature:
1. The controller shall monitor the supply air temperature.
 2. Alarms shall be provided as follows:
 - a. High Supply Air Temp: If the supply air temperature is greater than 120°F (adj.).
 - b. Low Supply Air Temp: If the supply air temperature is less than 45°F (adj.).
- S. Environmental Index:
1. When the zone is occupied, the controller will monitor the deviation of the zone temperature from the heating or cooling setpoint. The controller will also monitor the carbon dioxide level and compare it to comfort conditions. This data will be used to calculate a 0 - 100% *Environmental Index* which gives an indication of how well the zone is maintaining comfort. The controller will also calculate the percentage of time since occupancy began that the Environmental Index was 70% or higher.
 2. Leak Detection: A pan mounted spot type leak detector shall be installed. If water is detected an alarm shall be sent to the operator workstation.

| Point Name | Hardware Points | | | | Software Points | | | | | Show On Graphic |
|-------------------------------|-----------------|----|----|----|-----------------|----|-------|-------|-------|-----------------|
| | AI | AO | BI | BO | AV | BV | Sched | Trend | Alarm | |
| Zone Temp | x | | | | | | | x | | x |
| Zone Setpoint Adjust | x | | | | | | | | | x |
| Mixed Air Temp | x | | | | | | | x | | x |
| Return Air Carbon Dioxide PPM | x | | | | | | | x | | x |

| Point Name | Hardware Points | | | | Software Points | | | | | Show On Graphic |
|------------------------------------|-----------------|----|----|----|-----------------|----|-------|-------|-------|-----------------|
| | AI | AO | BI | BO | AV | BV | Sched | Trend | Alarm | |
| Return Air Humidity | x | | | | | | | x | | x |
| Return Air Temp | x | | | | | | | x | | x |
| Supply Air Temp | x | | | | | | | x | | x |
| Preheating Valve | | x | | | | | | x | | x |
| Heating Valve | | x | | | | | | x | | x |
| Mixed Air Dampers | | x | | | | | | x | | x |
| Zone Override | | | x | | | | | x | | x |
| Freezestat | | | x | | | | | x | x | x |
| Supply Fan Status | | | x | | | | | x | | x |
| Return Fan Status | | | x | | | | | x | | x |
| Prefilter Status | | | x | | | | | x | | |
| Leak Detection | | | x | | | | | | | x |
| Supply Fan Start/Stop | | | | x | | | | x | | x |
| Return Fan Start/Stop | | | | x | | | | x | | x |
| Cooling Stage 1 | | | | x | | | | x | | x |
| Cooling Stage 2 | | | | x | | | | x | | x |
| Cooling Stage 3 | | | | x | | | | x | | x |
| Cooling Stage 4 | | | | x | | | | x | | x |
| Preheating Mixed Air Temp Setpoint | | | | | x | | | x | | x |
| Economizer Zone Temp Setpoint | | | | | x | | | x | | x |
| Environmental Index | | | | | x | | | x | | |
| Percent of Time Satisfied | | | | | x | | | x | | |
| Schedule | | | | | | | x | | | |
| Heating Setpoint | | | | | | | | x | | x |
| Cooling Setpoint | | | | | | | | x | | x |
| High Zone Temp | | | | | | | | | x | |
| Low Zone Temp | | | | | | | | | x | |
| Supply Fan Failure | | | | | | | | | x | |
| Supply Fan in Hand | | | | | | | | | x | |
| Supply Fan Runtime Exceeded | | | | | | | | | x | |
| Return Fan Failure | | | | | | | | | x | |
| Return Fan in Hand | | | | | | | | | x | |
| Return Fan Runtime Exceeded | | | | | | | | | x | |
| Compressor Runtime Exceeded | | | | | | | | | x | |
| Prefilter Change Required | | | | | | | | | x | x |

| Point Name | Hardware Points | | | | Software Points | | | | | Show On Graphic | |
|--|-----------------|----|----|----|-----------------|----|-------|-------|-------|-----------------|--|
| | AI | AO | BI | BO | AV | BV | Sched | Trend | Alarm | | |
| High Mixed Air Temp | | | | | | | | | | x | |
| Low Mixed Air Temp | | | | | | | | | | x | |
| High Return Air Carbon Dioxide Concentration | | | | | | | | | | x | |
| High Return Air Humidity | | | | | | | | | | x | |
| Low Return Air Humidity | | | | | | | | | | x | |
| High Return Air Temp | | | | | | | | | | x | |
| Low Return Air Temp | | | | | | | | | | x | |
| High Supply Air Temp | | | | | | | | | | x | |
| Low Supply Air Temp | | | | | | | | | | x | |

Total Hardware (22)

Total Software (51)

1.2 Cabinet Heater (typical of 1)

Run Conditions - Continuous:

The unit shall run continuously and shall maintain a heating setpoint of 70°F (adj.).

Alarms shall be provided as follows:

Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

Fan:

The fan shall run anytime the zone temperature is below heating setpoint, unless shutdown on safeties.

Heating Coil Valve:

The controller shall measure the zone temperature and modulate the heating coil valve to maintain its heating setpoint.

The heating shall be enabled whenever:

Outside air temperature is less than 65°F (adj.).
AND the zone temperature is below heating setpoint.
AND the fan is on.

Fan Status:

The controller shall monitor the fan status.

Alarms shall be provided as follows:

Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.

T. Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

| Point Name | Hardware Points | | | | Software Points | | | | | | |
|----------------------|-----------------|----|----|----|-----------------|----|-------|-------|-------|-----------------|--|
| | AI | AO | BI | BO | AV | BV | Sched | Trend | Alarm | Show On Graphic | |
| Zone Temp | x | | | | | | | x | | x | |
| Heating Valve | | x | | | | | | x | | x | |
| Fan Status | | | x | | | | | x | | x | |
| Fan Start/Stop | | | | x | | | | x | | x | |
| Heating Setpoint | | | | | | | | x | | x | |
| Low Zone Temp | | | | | | | | | x | | |
| Fan Failure | | | | | | | | | x | | |
| Fan in Hand | | | | | | | | | x | | |
| Fan Runtime Exceeded | | | | | | | | | x | | |

Total Hardware (4)

Total Software (9)

1.3 Point Summary

| Equipment Name | Qty | Hardware Points | | | | Software Points | | | | | | |
|------------------------------------|------|-----------------|----|----|----|-----------------|----|-------|-------|-------|-----------------|--|
| | | AI | AO | BI | BO | AV | BV | Sched | Trend | Alarm | Show On Graphic | |
| Single Zone Unit
(Typical of 2) | Each | 7 | 3 | 6 | 6 | 4 | 0 | 1 | 26 | 20 | 26 | |
| Cabinet Heater
(Typical of 1) | Each | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 5 | 4 | 5 | |

Total Hardware (48)

Total Software (111)

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 15985

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SECTION 15990

TESTING, ADJUSTING AND BALANCING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and DDC General Conditions, apply to this Section.

1.02 SUMMARY

- A. This Section includes testing, adjusting, and balancing HVAC systems to produce design objectives, including the following:
1. Balancing airflow and water flow within distribution systems, including sub-mains, branches, and terminals, to indicated quantities according to specified tolerances.
 2. Adjusting total HVAC systems to provide indicated quantities.
 3. Measuring electrical performance of HVAC equipment.
 4. Setting quantitative performance of HVAC equipment.
 5. Verifying that automatic control devices are functioning properly.
 6. Measuring sound and vibration.
 7. Reporting results of the activities and procedures specified in this Section.

1.03 DEFINITIONS

- A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.
- B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to design quantities.
- C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.
- D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.
- E. Report Forms: Test data sheets for recording test data in logical order.
- F. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.
- G. Suction Head: The height of fluid surface above the centerline of the pump on the suction side.
- H. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
- I. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.
- J. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.

- K. Test: A procedure to determine quantitative performance of a system or equipment.
- L. Testing, Adjusting, and Balancing Agent: The entity responsible for performing and reporting the testing, adjusting, and balancing procedures.
- M. Retain acronyms and abbreviations that remain after this Section has been edited for Project.
- N. AABC: Associated Air Balance Council.
- O. AMCA: Air Movement and Control Association.
- P. CTI: Cooling Tower Institute.
- Q. NEBB: National Environmental Balancing Bureau.
- R. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

1.04 SUBMITTALS

- A. Quality-Assurance Submittals: Within 30 days from the Contractor's Notice to Proceed, submit 2 copies of evidence that the testing, adjusting, and balancing Agent and this Project's testing, adjusting, and balancing team members meet the qualifications specified in the "Quality Assurance" Article below.
- B. Contract Documents Examination Report: Within 45 days from the Contractor's Notice to Proceed, submit 2 copies of the Contract Documents review report as specified in Part 3 of this Section.
- C. Strategies and Procedures Plan: Within 60 days from the Contractor's Notice to Proceed, submit 2 copies of the testing, adjusting, and balancing strategies and step-by-step procedures as specified in Part 3 "Preparation" Article below. Include a complete set of report forms intended for use on this Project.
- D. Specify reports required because of editing procedures in Part 3 of this Section.
- E. Certified Testing, Adjusting, and Balancing Reports: Submit 2 copies of reports prepared, as specified in this Section, on approved forms certified by the testing, adjusting, and balancing Agent.
- F. Sample Report Forms: Submit 2 sets of sample testing, adjusting, and balancing report forms.
- G. Warranty: Submit 2 copies of special warranty specified in the "Warranty" Article below.

1.05 QUALITY ASSURANCE

- A. Agent Qualifications: Engage a testing, adjusting, and balancing agent certified by either AABC or NEBB.
- B. Testing, Adjusting, and Balancing Conference: Meet with the City of New York's and the Commissioner's representatives on approval of the testing, adjusting, and balancing strategies and procedures plan to develop a mutual understanding of the details. Ensure the participation of testing, adjusting, and balancing team members, equipment manufacturers' authorized service representatives, HVAC controls Installer, and other support personnel. Provide 7 days' advance notice of scheduled meeting time and location.
 - 1. Agenda Items: Include at least the following:
 - a. Submittal distribution requirements.
 - b. Contract Documents examination report.
 - c. Testing, adjusting, and balancing plan.

- d. Work schedule and Project site access requirements.
 - e. Coordination and cooperation of trades and subcontractors.
 - f. Coordination of documentation and communication flow.
- C. Certification of Testing, Adjusting, and Balancing Reports: Certify the testing, adjusting, and balancing field data reports. This certification includes the following:
- 1. Review field data reports to validate accuracy of data and to prepare certified testing, adjusting, and balancing reports.
 - 2. Certify that the testing, adjusting, and balancing team complied with the approved testing, adjusting, and balancing plan and the procedures specified and referenced in this Specification.
- D. Testing, Adjusting, and Balancing Reports: Use standard forms from SMACNA's "HVAC Systems--Testing, Adjusting, and Balancing."
- E. Instrumentation Type, Quantity, and Accuracy: As described in AABC national standards.
- F. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

1.06 PROJECT CONDITIONS

- A. Partial Owner Occupancy: The City of New York may occupy completed areas of the building before Substantial Completion. Cooperate with the City of New York during testing, adjusting, and balancing operations to minimize conflicts with the City of New York's operations.

1.07 COORDINATION

- A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.
- B. Notice: Provide 7 days' advance notice for each test. Include scheduled test dates and times.
- C. Perform testing, adjusting, and balancing after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

1.08 WARRANTY

- A. General Warranty: The national project performance guarantee specified in this Article shall not deprive the City of New York of other rights the City of New York 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 Guarantee: Provide a guarantee on NEBB forms stating that NEBB will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:
 - 1. The certified Agent has tested and balanced systems according to the Contract Documents.
 - 2. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 -PRODUCTS (NOT APPLICABLE)

PART 3 -EXECUTION

3.01 EXAMINATION

- A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.
 - 1. Contract Documents are defined in the General and Supplementary Conditions of the Contract.
 - 2. Verify that balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.
- B. Examine approved submittal data of HVAC systems and equipment.
- C. Examine project record documents described in General Conditions.
- D. Examine Commissioner's design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine equipment performance data, including fan and pump curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.
- F. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.
- G. Examine system and equipment test reports.
- H. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.
- I. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.
- J. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- K. Examine terminal units, such as variable-air-volume boxes and mixing boxes, to verify that they are accessible and their controls are connected and functioning.
- L. Examine plenum ceilings, utilized for supply air, to verify that they are airtight. Verify that pipe penetrations and other holes are sealed.
- M. Examine strainers for clean screens and proper perforations.
- N. Examine 3-way valves for proper installation for their intended function of diverting or mixing fluid flows.
- O. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

- P. Examine open-piping-system pumps to ensure absence of entrained air in the suction piping.
- Q. Examine equipment for installation and for properly operating safety interlocks and controls.
- R. Examine automatic temperature system components to verify the following:
 - 1. Dampers, valves, and other controlled devices operate by the intended controller.
 - 2. Dampers and valves are in the position indicated by the controller.
 - 3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in multizone units, mixing boxes, and variable-air-volume terminals.
 - 4. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.
 - 5. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.
 - 6. Sensors are located to sense only the intended conditions.
 - 7. Sequence of operation for control modes is according to the Contract Documents.
 - 8. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.
 - 9. Interlocked systems are operating.
 - 10. Changeover from heating to cooling mode occurs according to design values.
- S. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

3.02 PREPARATION

- A. Prepare a testing, adjusting, and balancing plan that includes strategies and step-by-step procedures.
- B. Complete system readiness checks and prepare system readiness reports. Verify the following:
 - 1. Permanent electrical power wiring is complete.
 - 2. Hydronic systems are filled, clean, and free of air.
 - 3. Automatic temperature-control systems are operational.
 - 4. Equipment and duct access doors are securely closed.
 - 5. Balance, smoke, and fire dampers are open.
 - 6. Isolating and balancing valves are open and control valves are operational.
 - 7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
 - 8. Windows and doors can be closed so design conditions for system operations can be met.

3.03 GENERAL TESTING AND BALANCING PROCEDURES

- A. Perform testing and balancing procedures on each system according to the procedures contained in SMACNA's "HVAC Systems--Testing, Adjusting, and Balancing" and this Section.

- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.
- C. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.04 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. For variable-air-volume systems, develop a plan to simulate diversity.
- D. Determine the best locations in main and branch ducts for accurate duct airflow measurements.
- E. Check the airflow patterns from the outside-air louvers and dampers and the return- and exhaust-air dampers, through the supply-fan discharge and mixing dampers.
- F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- G. Verify that motor starters are equipped with properly sized thermal protection.
- H. Check dampers for proper position to achieve desired airflow path.
- I. Check for airflow blockages.
- J. Check condensate drains for proper connections and functioning.
- K. Check for proper sealing of air-handling unit components.

3.05 CONSTANT-VOLUME AIR SYSTEMS' BALANCING PROCEDURES

- A. The procedures in this Article apply to constant-volume supply-, return-, and exhaust-air systems. Additional procedures are required for variable-air-volume, multizone, dual-duct, induction-unit supply-air systems and process exhaust-air systems. These additional procedures are specified in other articles in this Section.
- B. Adjust fans to deliver total design airflows within the maximum allowable rpm listed by the fan manufacturer.
 - 1. Measure fan static pressures to determine actual static pressure as follows:
 - a. Measure outlet static pressure as far downstream from the fan as practicable and upstream from restrictions in ducts such as elbows and transitions.
 - b. Measure static pressure directly at the fan outlet or through the flexible connection.
 - c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from flexible connection and downstream from duct restrictions.
 - d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
 - 2. Measure static pressure across each air-handling unit component.

- a. Simulate dirty filter operation and record the point at which maintenance personnel must change filters.
 - 3. Measure static pressures entering and leaving other devices such as sound traps, heat recovery equipment, and air washers under final balanced conditions.
 - 4. Compare design data with installed conditions to determine variations in design static pressures versus actual static pressures. Compare actual system effect factors with calculated system effect factors to identify where variations occur. Recommend corrective action to align design and actual conditions.
 - 5. Adjust fan speed higher or lower than design with the approval of the Commissioner. Make required adjustments to pulley sizes, motor sizes, and electrical connections to accommodate fan-speed changes.
 - 6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure no overload will occur. Measure amperage in full cooling, full heating, and economizer modes to determine the maximum required brake horsepower.
- C. Adjust volume dampers for main duct, submain ducts, and major branch ducts to design airflows within specified tolerances.
 - 1. Measure static pressure at a point downstream from the balancing damper and adjust volume dampers until the proper static pressure is achieved.
 - a. Where sufficient space in submains and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
 - 2. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submains and branch ducts to design airflows within specified tolerances.
- D. Measure terminal outlets and inlets without making adjustments.
 - 1. Measure terminal outlets using a direct-reading hood or the outlet manufacturer's written instructions and calculating factors.
- E. Adjust terminal outlets and inlets for each space to design airflows within specified tolerances of design values. Make adjustments using volume dampers rather than extractors and the dampers at the air terminals.
 - 1. Adjust each outlet in the same room or space to within specified tolerances of design quantities without generating noise levels above the limitations prescribed by the Contract Documents.
 - 2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.06 FUNDAMENTAL PROCEDURES FOR HYDRONIC SYSTEMS

- A. Prepare test reports with pertinent design data and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against approved pump flow rate. Correct variations that exceed plus or minus 5 percent.
- B. Prepare schematic diagrams of systems' "as-built" piping layouts.
- C. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:
 - 1. Open all manual valves for maximum flow.

2. Check expansion tank liquid level.
3. Check makeup-water-station pressure gage for adequate pressure for highest vent.
4. Check flow-control valves for specified sequence of operation and set at design flow.
5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type, unless several terminal valves are kept open.
6. Set system controls so automatic valves are wide open to heat exchangers.
7. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
8. Check air vents for a forceful liquid flow exiting from vents when manually operated.

3.07 HYDRONIC SYSTEMS' BALANCING PROCEDURES

- A. Determine water flow at pumps. Use the following procedures, except for positive-displacement pumps:
 1. Verify impeller size by operating the pump with the discharge valve closed. Verify with the pump manufacturer that this will not damage pump. Read pressure differential across the pump. Convert pressure to head and correct for differences in gage heights. Note the point on the manufacturer's pump curve at zero flow and confirm that the pump has the intended impeller size.
 2. Check system resistance. With all valves open, read pressure differential across the pump and mark the pump manufacturer's head-capacity curve. Adjust pump discharge valve until design water flow is achieved.
 3. Verify pump-motor brake horsepower. Calculate the intended brake horsepower for the system based on the pump manufacturer's performance data. Compare calculated brake horsepower with nameplate data on the pump motor. Report conditions where actual amperage exceeds motor nameplate amperage.
 4. Report flow rates that are not within plus or minus 5 percent of design.
- B. Set calibrated balancing valves, if installed, at calculated presettings.
- C. Measure flow at all stations and adjust, where necessary, to obtain first balance.
 1. System components that have Cv rating or an accurately cataloged flow-pressure-drop relationship may be used as a flow-indicating device.
- D. Measure flow at main balancing station and set main balancing device to achieve flow that is 5 percent greater than design flow.
- E. Adjust balancing stations to within specified tolerances of design flow rate as follows:
 1. Determine the balancing station with the highest percentage over design flow.
 2. Adjust each station in turn, beginning with the station with the highest percentage over design flow and proceeding to the station with the lowest percentage over design flow.
 3. Record settings and mark balancing devices.
- F. Measure pump flow rate and make final measurements of pump amperage, voltage, rpm, pump heads, and systems' pressures and temperatures, including outdoor-air temperature.
- G. Measure the differential-pressure control valve settings existing at the conclusions of balancing.

3.08 VARIABLE-FLOW HYDRONIC SYSTEMS' ADDITIONAL PROCEDURES

- A. Balance systems with automatic 2- and 3-way control valves by setting systems at maximum flow through heat-exchange terminals and proceed as specified above for hydronic systems.

3.09 PRIMARY-SECONDARY-FLOW HYDRONIC SYSTEMS' ADDITIONAL PROCEDURES

- A. Balance the primary system crossover flow first, then balance the secondary system.

3.10 HEAT EXCHANGERS

- A. Measure water flow through all circuits.
- B. Adjust water flow to within specified tolerances.
- C. Measure inlet and outlet water temperatures.
- D. Measure inlet steam pressure. Check the setting and operation of automatic temperature-control valves, self-contained control valves, and pressure-reducing valves.
- E. Record safety valve settings.
- F. Verify operation of steam traps.

3.11 MOTORS

- A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
 - 1. Manufacturer, model, and serial numbers.
 - 2. Motor horsepower rating.
 - 3. Motor rpm.
 - 4. Efficiency rating if high-efficiency motor.
 - 5. Nameplate and measured voltage, each phase.
 - 6. Nameplate and measured amperage, each phase.
 - 7. Starter thermal-protection-element rating.
- B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass for the controller to prove proper operation. Record observations, including controller manufacturer, model and serial numbers, and nameplate data.

3.12 BOILERS

- A. Measure entering- and leaving-water temperatures and water flow.

3.13 TEMPERATURE TESTING

- A. During testing, adjusting, and balancing, report need for adjustment in temperature regulation within the automatic temperature-control system.
- B. Measure indoor wet- and dry-bulb temperatures every other hour for a period of 2 successive 8-hour days, in each separately controlled zone, to prove correctness of final temperature settings. Measure when the building or zone is occupied.
- C. Measure outside-air, wet- and dry-bulb temperatures.

3.14 TEMPERATURE-CONTROL VERIFICATION

- A. Verify that controllers are calibrated and commissioned.
- B. Check transmitter and controller locations and note conditions that would adversely affect control functions.
- C. Record controller settings and note variances between set points and actual measurements.
- D. Verify operation of limiting controllers (i.e., high- and low-temperature controllers).
- E. Verify free travel and proper operation of control devices such as damper and valve operators.
- F. Verify sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water-flow measurements. Note the speed of response to input changes.
- G. Confirm interaction of electrically operated switch transducers.
- H. Confirm interaction of interlock and lockout systems.
- I. Verify main control supply-air pressure and observe compressor and dryer operations.
- J. Record voltages of power supply and controller output. Determine if the system operates on a grounded or nongrounded power supply.
- K. Note operation of electric actuators using spring return for proper fail-safe operations.

3.15 TOLERANCES

- A. Set HVAC system airflow and water flow rates within the following tolerances:
 - 1. Supply, Return, and Exhaust Fans: Plus 5 to plus 10 percent.
 - 2. Air Outlets and Inlets: 0 to minus 10 percent.
 - 3. Heating-Water Flow Rate: 0 to minus 10 percent.
 - 4. Cooling-Water Flow Rate: 0 to minus 5 percent.

3.16 REPORTING

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article above, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.
- B. Status Reports: As Work progresses, prepare reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.17 FINAL REPORT

- A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.
- B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.
- C. Final Report Contents: In addition to the certified field report data, include the following:
 - 1. Manufacturers' test data.

2. Field test reports prepared by system and equipment installers.
 3. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.
- D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:
1. Title page.
 2. Name and address of testing, adjusting, and balancing Agent.
 3. Project name.
 4. Project location.
 5. Commissioner's name and address.
 6. Contractor's name and address.
 7. Report date.
 8. Signature of testing, adjusting, and balancing Agent who certifies the report.
 9. Summary of contents, including the following:
 - a. Design versus final performance.
 - b. Notable characteristics of systems.
 - c. Description of system operation sequence if it varies from the Contract Documents.
 10. Nomenclature sheets for each item of equipment.
 11. Data for terminal units, including manufacturer, type size, and fittings.
 12. Notes to explain why certain final data in the body of reports vary from design values.
 13. Test conditions for fans and pump performance forms, including the following:
 - a. Settings for outside-, return-, and exhaust-air dampers.
 - b. Conditions of filters.
 - c. Cooling coil, wet- and dry-bulb conditions.
 - d. Face and bypass damper settings at coils.
 - e. Fan drive settings, including settings and percentage of maximum pitch diameter.
 - f. Inlet vane settings for variable-air-volume systems.
 - g. Settings for supply-air, static-pressure controller.
 - h. Other system operating conditions that affect performance.
 14. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present with single-line diagrams and include the following:
 - a. Quantities of outside, supply, return, and exhaust airflows.

- b. Water and steam flow rates.
 - c. Duct, outlet, and inlet sizes.
 - d. Pipe and valve sizes and locations.
 - e. Terminal units.
 - f. Balancing stations.
- E. Air-Handling Unit Test Reports: For air-handling units with coils, include the following:
- 1. Unit Data: Include the following:
 - a. Unit identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and unit size.
 - e. Manufacturer's serial number.
 - f. Unit arrangement and class.
 - g. Discharge arrangement.
 - h. Sheave make, size in inches, and bore.
 - i. Sheave dimensions, center-to-center and amount of adjustments in inches.
 - j. Number of belts, make, and size.
 - k. Number of filters, type, and size.
 - 2. Motor Data: Include the following:
 - 3. Make and frame type and size.
 - a. Horsepower and rpm.
 - b. Volts, phase, and hertz.
 - c. Full-load amperage and service factor.
 - d. Sheave make, size in inches, and bore.
 - e. Sheave dimensions, center-to-center and amount of adjustments in inches.
 - 4. Test Data: Include design and actual values for the following:
 - a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Filter static-pressure differential in inches wg.
 - f. Preheat coil static-pressure differential in inches wg.

- g. Cooling coil static-pressure differential in inches wg.
- h. Heating coil static-pressure differential in inches wg.
- i. Outside airflow in cfm.
- j. Return airflow in cfm.
- k. Outside-air damper position.
- l. Return-air damper position.
- m. Vortex damper position.

F. Apparatus-Coil Test Reports: For apparatus coils, include the following:

- 1. Coil Data: Include the following:
 - a. System identification.
 - b. Location.
 - c. Coil type.
 - d. Number of rows.
 - e. Fin spacing in fins per inch.
 - f. Make and model number.
 - g. Face area in sq. ft..
 - h. Tube size in NPS.
 - i. Tube and fin materials.
 - j. Circuiting arrangement.
- 2. Test Data: Include design and actual values for the following:
 - a. Airflow rate in cfm.
 - b. Average face velocity in fpm.
 - c. Air pressure drop in inches wg.
 - d. Outside-air, wet- and dry-bulb temperatures in deg F.
 - e. Return-air, wet- and dry-bulb temperatures in deg F.
 - f. Entering-air, wet- and dry-bulb temperatures in deg F.
 - g. Leaving-air, wet- and dry-bulb temperatures in deg F.
 - h. Water flow rate in gpm.
 - i. Water pressure differential in feet of head or psig.
 - j. Entering-water temperature in deg F.
 - k. Leaving-water temperature in deg F.
 - l. Refrigerant expansion valve and refrigerant types.

- m. Refrigerant suction pressure in psig.
- n. Refrigerant suction temperature in deg F.
- o. Inlet steam pressure in psig.

G. Fan Test Reports: For supply, return, and exhaust fans, include the following:

- 1. Fan Data: Include the following:
 - a. System identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and size.
 - e. Manufacturer's serial number.
 - f. Arrangement and class.
 - g. Sheave make, size in inches, and bore.
 - h. Sheave dimensions, center-to-center and amount of adjustments in inches.
- 2. Motor Data: Include the following:
 - a. Make and frame type and size.
 - b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Sheave dimensions, center-to-center and amount of adjustments in inches.
 - g. Number of belts, make, and size.
- 3. Test Data: Include design and actual values for the following:
 - a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Suction static pressure in inches wg.

H. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

- 1. Report Data: Include the following:
 - a. System and air-handling unit number.

- b. Location and zone.
 - c. Traverse air temperature in deg F.
 - d. Duct static pressure in inches wg.
 - e. Duct size in inches.
 - f. Duct area in sq. ft..
 - g. Design airflow rate in cfm.
 - h. Design velocity in fpm.
 - i. Actual airflow rate in cfm.
 - j. Actual average velocity in fpm.
 - k. Barometric pressure in psig.
2. Air-Terminal-Device Reports: For terminal units, include the following:
- a. Unit Data: Include the following:
 - b. System and air-handling unit identification.
 - c. Location and zone.
 - d. Test apparatus used.
 - e. Area served.
 - f. Air-terminal-device make.
 - g. Air-terminal-device number from system diagram.
 - h. Air-terminal-device type and model number.
 - i. Air-terminal-device size.
 - j. Air-terminal-device effective area in sq. ft.
3. Test Data: Include design and actual values for the following:
- a. Airflow rate in cfm.
 - b. Air velocity in fpm.
 - c. Preliminary airflow rate as needed in cfm.
 - d. Preliminary velocity as needed in fpm.
 - e. Final airflow rate in cfm.
 - f. Final velocity in fpm.
 - g. Space temperature in deg F.

1. Instrument Calibration Reports: For instrument calibration, include the following:

- 1. Report Data: Include the following:

- a. Instrument type and make.
- b. Serial number.
- c. Application.
- d. Dates of use.
- e. Dates of calibration.

3.18 ADDITIONAL TESTS

- A. Within 90 days of completing testing, adjusting, and balancing, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial testing, adjusting, and balancing procedures were not performed during near-peak summer and winter conditions, perform additional inspections, testing, and adjusting during near-peak summer and winter conditions.

END OF SECTION 15990

SECTION P15052

COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
1. Piping materials and installation instructions common to most piping systems.
 2. Transition fittings.
 3. Dielectric fittings.
 4. Mechanical sleeve seals.
 5. Sleeves.
 6. Escutcheons.
 7. Grout.
 8. Plumbing demolition.
 9. Equipment installation requirements common to equipment sections.
 10. Painting and finishing.
 11. Concrete bases.
 12. Supports and anchorages.

1.3 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspace, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.
- F. The following are industry abbreviations for rubber materials:
1. EPDM: Ethylene-propylene-diene terpolymer rubber.

2. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Transition fittings.
2. Dielectric fittings.
3. Mechanical sleeve seals.
4. Escutcheons.

B. Welding certificates.

1.5 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.7 COORDINATION

A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for plumbing installations.

B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

C. Coordinate requirements for access panels and doors for plumbing items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 8 Section "Access Doors and Frames."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 15 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.3 JOINING MATERIALS

- A. Refer to individual Division 15 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
 - 1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
 - 2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.
- F. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- G. Fiberglass Pipe Adhesive: As furnished or recommended by pipe manufacturer.

2.4 TRANSITION FITTINGS

- A. AWWA Transition Couplings: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.
 - 1. Manufacturers:
 - a. Dresser Industries, Inc.; DMD Div.
 - b. Ford Meter Box Company, Incorporated (The); Pipe Products Div.
 - c. JCM Industries.
 - 2. Underground Piping NPS 1-1/2 and Smaller: Manufactured fitting or coupling.
 - 3. Underground Piping NPS 2 and Larger: AWWA C219, metal sleeve-type coupling.
 - 4. Aboveground Pressure Piping: Pipe fitting.

2.5 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.
 - 1. Manufacturers:
 - a. Eclipse, Inc.
 - b. Watts Industries, Inc.; Water Products Div.
 - c. Zurn Industries, Inc.; Wilkins Div.
- D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig minimum working pressure as required to suit system pressures.
 - 1. Manufacturers:
 - a. Capitol Manufacturing Co.
 - b. Epco Sales, Inc.
 - c. Watts Industries, Inc.; Water Products Div.
- E. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
 - 1. Manufacturers:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Pipeline Seal and Insulator, Inc.
 - 2. Separate companion flanges and steel bolts and nuts shall have 150- or 300-psig minimum working pressure where required to suit system pressures.

F. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.

1. Manufacturers:

- a. Calpico, Inc.
- b. Lochinvar Corp.
- c. Perpection Corp.

G. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

1. Manufacturers:

- a. Precision Plumbing Products, Inc.
- b. Sioux Chief Manufacturing Co., Inc.
- c. Victaulic Co. of America.

2.6 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

1. Manufacturers:

- a. Calpico, Inc.
- b. Metraflex Co.
- c. Pipeline Seal and Insulator, Inc.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Stainless steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.7 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

1. Underdeck Clamp: Clamping ring with set screws.

E. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

2.8 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- C. One-Piece, Cast-Brass Type: With set screw.
 - 1. Finish: Polished chrome-plated and rough brass.
- D. One-Piece, Stamped-Steel Type: With set screw or spring clips and chrome-plated finish.
- E. One-Piece, Floor-Plate Type: Cast-iron floor plate.
- F. Split-Casting, Floor-Plate Type: Cast brass with concealed hinge and set screw.

2.9 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
 - 1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.
 - 3. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 PLUMBING DEMOLITION

- A. Refer to General Conditions for general demolition requirements and procedures.
- B. Disconnect, demolish, and remove plumbing systems, equipment, and components indicated to be removed.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - 3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - 4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - 5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to the City of New York.
- C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 15 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping to permit valve servicing.
- G. Install piping at indicated slopes.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Install escutcheons for penetrations of walls, ceilings, and floors according to the following:
 - 1. New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass type with polished chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type with spring clips.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
 - e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
 - g. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished chrome-plated finish.
 - h. Bare Piping in Equipment Rooms: One-piece, cast-brass type.
 - i. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece, floor-plate type.
- M. Sleeves are not required for core-drilled holes.
- N. Permanent sleeves are not required for holes formed by removable PE sleeves.
- O. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.

- P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
 3. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
 - a. Steel Pipe Sleeves: For pipes smaller than NPS 6.
 - b. Steel Sheet Sleeves: For pipes NPS 6 and larger, penetrating gypsum-board partitions.
 - c. Stack Sleeve Fittings: For pipes penetrating floors with membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level. Delete first subparagraph below if not required.
 - 1) Seal space outside of sleeve fittings with grout.
 4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 7 Section 07900 "Joint Sealers" for materials and installation.
- Q. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Install steel pipe for sleeves smaller than 6 inches in diameter.
 2. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
 3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- R. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- S. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 7 Section 07270 "Firestops and Smokestops" for materials.
- T. Verify final equipment locations for roughing-in.
- U. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 15 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- I. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.4 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
 - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
 - 3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
 - 4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

3.6 PAINTING

- A. Painting of plumbing systems, equipment, and components is specified in Division 9 Sections 09900 "Paintings and Finishing."
- B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.7 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
 1. Construct concrete bases of dimensions indicated, but not less than 6 inches larger in both directions than supported unit.
 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
 3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
 4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 5. Install anchor bolts to elevations required for proper attachment to supported equipment.
 6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
 7. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section 03301 "Concrete-site application (sidewalks)."

3.8 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Division 5 Section 05500 "Miscellaneous Metals" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor plumbing materials and equipment.
- C. Field Welding: Comply with AWS D1.1.

3.9 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor plumbing materials and equipment.

- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

3.10 GROUTING

- A. Mix and install grout for plumbing equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

END OF SECTION 15052

No Text on This Page

SECTION P15061

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. This Section includes the following hangers and supports for plumbing system piping and equipment:

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Fastener systems.
5. Pipe stands.
6. Equipment supports.

- B. Related Sections include the following:

1. Division 5 Section 05500 "Miscellaneous Metals" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
2. Division 15 Section 15073 "Vibration and Seismic Controls for Plumbing Piping and Equipment" for vibration isolation devices.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.
- B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.4 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.5 SUBMITTALS

- A. Product Data: For the following:
1. Steel pipe hangers and supports.
 2. Thermal-hanger shield inserts.
 3. Powder-actuated fastener systems.
 4. Pipe positioning systems.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:
1. Trapeze pipe hangers. Include Product Data for components.
 2. Metal framing systems. Include Product Data for components.
 3. Pipe stands. Include Product Data for components.
 4. Equipment supports.
- C. Welding certificates.

1.6 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- B. Welding: Qualify procedures and personnel according to the following:
1. AWS D1.4, "Structural Welding Code--Reinforcing Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 STEEL PIPE HANGERS AND SUPPORTS

- A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
- B. Manufacturers:
1. B-Line Systems, Inc.; a division of Cooper Industries.
 2. Carpenter & Paterson, Inc.
 3. Grinnell Corp.
 4. Tolco Inc.
 5. Or Approved Equal.

- C. Galvanized Coatings: hot dipped.
- D. Nonmetallic Coatings: jacket or liner.
- E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.3 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.4 METAL FRAMING SYSTEMS

- A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

- B. Manufacturers:

- 1. B-Line Systems, Inc.; a division of Cooper Industries.
- 2. Tolco Inc.
- 3. Unistrut Corp.; Tyco International, Ltd.
- 4. Or Approved Equal.

- C. Coatings: Manufacturer's standard finish unless bare metal surfaces are indicated.

- D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.5 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

- 1. Manufacturers:

- a. Hilti, Inc.
- b. MKT Fastening, LLC.
- c. Powers Fasteners.
- d. Or Approved Equal

- B. Mechanical-Expansion Anchors: Insert-wedge-type stainless steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

- 1. Manufacturers:

- a. B-Line Systems, Inc.; a division of Cooper Industries.
- b. Hilti, Inc.
- c. Powers Fasteners.
- d. Or Approved Equal.

2.6 PIPE STAND FABRICATION

- A. Pipe Stands, General: Shop or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Compact Pipe Stand: One-piece plastic unit with integral-rod-roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
 - 1. Manufacturers:
 - a. ERICO/Michigan Hanger Co.
 - b. MIRO Industries.
 - c. B-Line Systems Inc.
 - d. Or Approved Equal.

2.7 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

2.8 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi , 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use padded hangers for piping that is subject to scratching.
- F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
 2. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, NPS 1/2 to NPS 24, if little or no insulation is required.
 3. U-BoIts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30.
 4. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 5. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36, with steel pipe base stanchion support and cast-iron floor flange.
 6. Pipe Stanchion Saddles (MSS Type 37): For support of pipes, NPS 4 to NPS 36, with steel pipe base stanchion support and cast-iron floor flange and with U-bolt to retain pipe.
 7. Adjustable, Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, NPS 2-1/2 to NPS 36, if vertical adjustment is required, with steel pipe base stanchion support and cast-iron floor flange.
- G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20, if longer ends are required for riser clamps.
- H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 3. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 4. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. C-Clamps with retaining clips (MSS Type 23): For structural shapes.
 5. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 6. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 7. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 8. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 9. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- J. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

- K. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from trapeze support.
- L. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
- M. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
- N. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.
- O. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

3.2 HANGER AND SUPPORT INSTALLATION

- A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
 2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.
- D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- E. Fastener System Installation:
1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

- F. Pipe Stand Installation:
1. Pipe Stand Types except Curb-Mounting Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
 2. Curb-Mounting-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. Refer to Division 7 Section "Roof Accessories" for curbs.
- G. Pipe Positioning System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture. Refer to Division 15 Section "Plumbing Fixtures" for plumbing fixtures.
- H. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- I. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- J. Install hangers and supports to allow controlled thermal and seismic 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.
- K. Install lateral bracing with pipe hangers and supports to prevent swaying.
- L. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- M. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- N. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.
- O. Insulated Piping: Comply with the following:
1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits according to ASME B31.9 for building services piping.
 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 4. Shield Dimensions for Pipe: Not less than the following:

- a. NPS 1/4 to NPS 3-1/2 : 12 inches long and 0.048 inch thick.
 - b. NPS 4 to NPS 12: 24 inches long and 0.075 inch thick.
5. Insert Material: Length at least as long as protective shield.
 6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.3 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make smooth bearing surface.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

END OF SECTION 15061

SECTION P15073

VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Isolation pads.
 - 2. Isolation mounts.
 - 3. Restrained elastomeric isolation mounts.
 - 4. Freestanding and restrained spring isolators.
 - 5. Housed spring mounts.
 - 6. Elastomeric hangers.
 - 7. Spring hangers.
 - 8. Spring hangers with vertical-limit stops.
 - 9. Pipe riser resilient supports.
 - 10. Resilient pipe guides.
 - 11. Seismic snubbers.
 - 12. Restraining braces and cables.
 - 13. Steel and inertia, vibration isolation equipment bases.

1.3 DEFINITIONS

- A. IBC: International Building Code.
- B. ICC-ES: ICC-Evaluation Service.
- C. OSHPD: Office of Statewide Health Planning and Development for the State of California.

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic-load design data: To be submitted by licensed structural engineer and obtain approval from authorities having jurisdiction.

1.5 SUBMITTALS

- A. Product Data: For the following:
 - 1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.

2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
 - a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to authorities having jurisdiction.
 - b. Annotate to indicate application of each product submitted and compliance with requirements.
 3. Interlocking Snubbers: Include ratings for horizontal, vertical, and combined loads.
- B. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators, seismic restraints, and for designing vibration isolation bases.
 2. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure, spring deflection changes, and seismic loads. Include certification that riser system has been examined for excessive stress and that none will exist.
 3. Vibration Isolation Base Details: Detail overall dimensions, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, base weights, equipment static loads, power transmission, component misalignment, and cantilever loads.
 4. Seismic-Restraint Details:
 - a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
 - c. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval, tests or calculations.
- C. Coordination Drawings: Show coordination of seismic bracing for plumbing piping and equipment with other systems and equipment in the vicinity, including other supports and seismic restraints.
- D. Welding certificates.
- E. Qualification Data: For professional engineer and testing agency.
- F. Field quality-control test reports.
- G. Operation and Maintenance Data: For air-mounting systems to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
- B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproved by ICC-ES, or preapproved by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - 1. Mason Industries.
 - 2. Vibration Eliminator Co., Inc.
 - 3. Vibration Isolation.
- D. Pads: Arranged in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
 - 1. Resilient Material: Oil- and water-resistant neoprene.
- E. Mounts: Double-deflection type, with molded, oil-resistant rubber, hermetically sealed compressed fiberglass, or neoprene isolator elements with factory-drilled, encapsulated top plate for bolting to equipment and with baseplate for bolting to structure. Color-code or otherwise identify to indicate capacity range.
 - 1. Materials: Cast-ductile-iron or welded steel housing containing two separate and opposing, oil-resistant rubber or neoprene elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.
 - 2. Neoprene: Shock-absorbing materials compounded according to the standard for bridge-bearing neoprene as defined by AASHTO.

- F. **Restrained Mounts:** All-directional mountings with seismic restraint.
1. **Materials:** Cast-ductile-iron or welded steel housing containing two separate and opposing, oil-resistant rubber or neoprene elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.
 2. **Neoprene:** Shock-absorbing materials compounded according to the standard for bridge-bearing neoprene as defined by AASHTO.
- G. **Spring Isolators:** Freestanding, laterally stable, open-spring isolators.
1. **Outside Spring Diameter:** Not less than 80 percent of the compressed height of the spring at rated load.
 2. **Minimum Additional Travel:** 50 percent of the required deflection at rated load.
 3. **Lateral Stiffness:** More than 80 percent of rated vertical stiffness.
 4. **Overload Capacity:** Support 200 percent of rated load, fully compressed, without deformation or failure.
 5. **Baseplates:** Factory drilled for bolting to structure and bonded to 1/4-inch- thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig.
 6. **Top Plate and Adjustment Bolt:** Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.
- H. **Restrained Spring Isolators:** Freestanding, steel, open-spring isolators with seismic or limit-stop restraint.
1. **Housing:** Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- thick, neoprene or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
 2. **Restraint:** Seismic or limit-stop as required for equipment and authorities having jurisdiction.
 3. **Outside Spring Diameter:** Not less than 80 percent of the compressed height of the spring at rated load.
 4. **Minimum Additional Travel:** 50 percent of the required deflection at rated load.
 5. **Lateral Stiffness:** More than 80 percent of rated vertical stiffness.
 6. **Overload Capacity:** Support 200 percent of rated load, fully compressed, without deformation or failure.
- I. **Elastomeric Hangers:** Single or double-deflection type, fitted with molded, oil-resistant elastomeric isolator elements bonded to steel housings with threaded connections for hanger rods. Color-code or otherwise identify to indicate capacity range.
- J. **Spring Hangers:** Combination coil-spring and elastomeric-insert hanger with spring and insert in compression.
1. **Frame:** Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
 2. **Outside Spring Diameter:** Not less than 80 percent of the compressed height of the spring at rated load.
 3. **Minimum Additional Travel:** 50 percent of the required deflection at rated load.
 4. **Lateral Stiffness:** More than 80 percent of rated vertical stiffness.
 5. **Overload Capacity:** Support 200 percent of rated load, fully compressed, without deformation or failure.
 6. **Elastomeric Element:** Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
 7. **Self-centering hanger rod cap** to ensure concentricity between hanger rod and support spring coil.

2.2 SEISMIC-RESTRAINT DEVICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - 1. Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2. Hilti, Inc.
 - 3. Mason Industries.
 - 4. TOLCO Incorporated; a brand of NIBCO INC.
 - 5. Unistrut; Tyco International, Ltd.
- D. General Requirements for Restraint Components: Rated strengths, features, and applications shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
 - 1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least five times the maximum seismic forces to which they will be subjected.
- E. Snubbers: Factory fabricated using welded structural-steel shapes and plates, anchor bolts, and replaceable resilient isolation washers and bushings.
 - 1. Anchor bolts for attaching to concrete shall be seismic-rated, drill-in, and stud-wedge or female-wedge type.
 - 2. Resilient Isolation Washers and Bushings: Oil- and water-resistant neoprene.
 - 3. Maximum 1/4-inch air gap, and minimum 1/4-inch- thick resilient cushion.
- F. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
- G. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod.
- H. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- I. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- J. Adhesive Anchor Bolts: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.3 FACTORY FINISHES

- A. Finish: Manufacturer's standard prime-coat finish ready for field painting.

- B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
 - 1. Powder coating on springs and housings.
 - 2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
 - 3. Baked enamel or powder coat for metal components on isolators for interior use.
 - 4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Multiple Pipe Supports: Secure pipes to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.
- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.3 VIBRATION-CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Equipment Restraints:
 - 1. Install seismic snubbers on plumbing equipment mounted on vibration isolators. Locate snubbers as close as possible to vibration isolators and bolt to equipment base and supporting structure.
 - 2. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inches.
 - 3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction providing required submittals for component.
- B. Piping Restraints:
 - 1. Comply with requirements in MSS SP-127.
 - 2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
 - 3. Brace a change of direction longer than 12 feet.

- C. Install cables so they do not bend across edges of adjacent equipment or building structure.
- D. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction providing required submittals for component.
- E. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- F. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- G. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- H. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 - 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
 - 6. Install zinc-coated steel anchors for interior and stainless steel anchors for exterior applications.

3.4 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Division 15 Section "Domestic Water Piping" for piping flexible connections.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
- C. Tests and Inspections:
 - 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
 - 2. Schedule test with the City of New York, through Commissioner, before connecting anchorage device to restrained component unless postconnection testing has been approved, and with at least seven days' advance notice.

3. Obtain Commissioner's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 4. Test at least four of each type and size of installed anchors and fasteners selected by Commissioner.
 5. Test to 90 percent of rated proof load of device.
 6. Measure isolator restraint clearance.
 7. Measure isolator deflection.
 8. Verify snubber minimum clearances.
 9. Air-Mounting System Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 10. Air-Mounting System Operational Test: Test the compressed-air leveling system.
 11. Test and adjust air-mounting system controls and safeties.
 12. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Adjust isolators after piping system is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
- C. Adjust active height of sprint isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 15073

SECTION P15076

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Stencils.
 - 5. Valve tags.
 - 6. Warning tags.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

1.4 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:

1. **Material and Thickness:** Stainless steel, 0.025-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
2. **Minimum Label Size:** Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
3. **Minimum Letter Size:** 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
4. **Fasteners:** Stainless-steel rivets or self-tapping screws.
5. **Adhesive:** Contact-type permanent adhesive, compatible with label and with substrate.

B. Label Content:

Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

C. Equipment Label Schedule:

For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

- A. **Material and Thickness:** Multilayer, multicolor labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- B. **Letter Color:** Red.
- C. **Background Color:** White.
- D. **Maximum Temperature:** Able to withstand temperatures up to 160 deg F.
- E. **Minimum Label Size:** Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. **Minimum Letter Size:** 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. **Fasteners:** Stainless-steel rivets or self-tapping screws.
- H. **Adhesive:** Contact-type permanent adhesive, compatible with label and with substrate.
- I. **Label Content:** Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Pretensioned Pipe Labels: Precoiled, semirigid formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
 - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
 - 2. Lettering Size: At least 1-1/2 inches high.

2.4 STENCILS

- A. Stencils: Prepared with letter sizes according to ASME A13.1 for piping; and minimum letter height of 3/4 inch for access panel and door labels, equipment labels, and similar operational instructions.
 - 1. Stencil Material: Aluminum.
 - 2. Stencil Paint: Exterior, gloss, alkyd enamel, black unless otherwise indicated. Paint may be in pressurized spray-can form.
 - 3. Identification Paint: Exterior, alkyd enamel in colors according to ASME A13.1 unless otherwise indicated.

2.5 VALVE TAGS

- A. Valve Tags: Stamped or engraved with 1/2-inch letters for piping system abbreviation and 1/2-inch numbers.
 - 1. Tag Material: Stainless steel, 0.025-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 - 2. Fasteners: Brass wire-link or beaded chain; or S-hook.
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation as shown on valve tag, location of valve, normal-operating position -- open-- and variations for identification. Mark valves for emergency shutoff and similar special uses.
 - 1. Valve-tag schedule shall be included in operation and maintenance data.

2.6 WARNING TAGS

- A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of card stock with matte finish suitable for writing.
 - 1. Size: Rectangular 4 by 8 inches.
 - 2. Fasteners: Brass grommet and wire.
 - 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."

4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.3 PIPE LABEL INSTALLATION

- A. Piping Color-Coding: Painting of piping is specified in Division 9 Section 09900 "Painting and Finishing."
- B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels with painted, color-coded bands or rectangles, complying with ASME A13.1, on each piping system.
 1. Identification Paint: Use for contrasting background.
 2. Stencil Paint: Use for pipe marking.
- C. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 1. Near each valve and control device.
 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 5. Near major equipment items and other points of origination and termination.
 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- D. Pipe Label Color Schedule:
 1. Domestic Water Piping:
 - a. Background Color: Green.
 - b. Letter Color: Blue.
 2. Sanitary Waste and Storm Drainage Piping:
 - a. Background Color: Yellow.

- b. Letter Color: Black.

3.4 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
 - 1. Valve-Tag Size and Shape:
 - a. Cold Water: 2 inches, round..
 - b. Hot Water: 2 inches, round.
 - 2. Valve-Tag Color:
 - a. Cold Water: Green.
 - b. Hot Water: Red.
 - 3. Letter Color:
 - a. Cold Water: Blue.
 - b. Hot Water: White.

3.5 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 15076

No Text on This Page

SECTION P15082

PLUMBING INSULATION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.02 WORK INCLUDED

- A. The work covered by this section includes the construction described in the Contract Documents including all labor necessary to perform and complete such construction, all materials and equipment incorporated or to be incorporated in such construction, and all services, facilities, tools and equipment necessary or used to perform and complete such construction. The work includes, but is not limited to the following:

- 1. Piping Insulation.
- 2. Valve Insulation.
- 3. Equipment Insulation.

1.03 SUBMITTALS

- A. Shop Drawings: Submit insulation shop drawings for each service.
- B. Product Data: Manufacturer's latest published data for materials, equipment and installation.

1.04 QUALITY ASSURANCE

- A. Refer to General Conditions for Plumbing Work for quality assurance requirements.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Conform to application schedule specified herein for types and thicknesses of insulation.
- B. Provide insulation (including insulation jacket or facing and adhesives used to adhere the facing or jacket to the insulation) with noncombustible material meeting all Code requirements and fire and smoke hazard ratings as tested by procedure ASTM E-84, National Fire Protection Association 225, and UL 723, not exceeding flame spread 25 and smoke developed 50.
- C. Acceptable Manufacturers
 - 1. Insulation:
 - a. Owens-Corning Fiberglass
 - b. Johns-Manville
 - c. Armstrong; Certain-Teed
 - d. Pittsburg Plate Glass
 - 2. Adhesives and Sealers:
 - a. Benjamin Foster (B-F)
 - b. Insul-Coustic (I-C)
 - c. Minnesota Mining and Mfg. Co. (3M)

2.02 PIPE INSULATION

A. Materials

INSULATION THICKNESS IN INCHES FOR PIPE SIZES

| <u>Service</u> | <u>Material</u> | <u>1" and
less</u> | <u>1-1/4"
to 2"</u> | <u>2-1/2"
to 4"</u> | <u>5" to 6"</u> | <u>8" and
larger</u> |
|---|-----------------|------------------------|-------------------------|-------------------------|-----------------|--------------------------|
| Horizontal storm drains
and drain bodies | Glass fiber | --- | --- | 1/2 | 1/2 | 1/2 |
| Hot Water | Glass fiber | 3/4 | 1 | 1 | 1 | |
| Domestic Cold Water | Glass fiber | 1 | 1 | 1 | 1 | 1 |

B. Fiberglass Density: All Fiberglass pipe insulation in equipment rooms and/or where exposed to be of the sectional type having 6 lbs/cu ft density. All other Fiberglass insulation to be of the 1-piece type having 4 lb density.

C. Insulation Jackets

1. Hot pipes concealed: Factory applied white fire retardant jacket, (ASJ), stapled and banded. Pipes banded with not less than 3 bands per section.
2. Hot pipes exposed: Factory applied white fire retardant jacket, (ASJ), with butt strips stapled and banded. Pipes banded with not less than 3 bands per section.
3. Cold pipes concealed and exposed: Factory applied white fire retardant jacket with self-sealing lap (ASJ) and butt strip. Ends of pipe insulation sealed off at valves, fittings and flanges with I.C. 301 or FB 30-35).

D. Fittings, Valves and Flanges

1. Where manufactured, use factory premolded fittings (of the same material and thickness as the pipe insulation) for all fittings, flanges and valves.
2. Where premolded insulation fittings are not manufactured, insulate all fittings, flanges and valves with mitered segments of the same density as the adjoining pipe covering. Finish hot service applications with open weave glass mesh adhered with I.C. 501 (or BF 30-35). Vaporseal for cold applications with I.C. 501 (or BF 30-35) adhesive with open weave glass mesh laid in while wet with final coat with I.C. 501 (or BF 30-35) adhesive. Overlap glass mesh and outer coat adjacent covering by at least 2 in. Do not insulate flanges until systems are operational.
3. Provide insulation for removable flanges of pipe strainers on cold services with built-up sections of glass fiber pipe covering, arranged to facilitate servicing of the strainer. Complete applications with vaporseals. All vapor barriers to be sealed and continuous through hangers, walls, sleeves, etc. All adhesives and coatings to be as noted herein.
4. Insulate fittings, flanges, valves, etc. for services where calcium silicate insulation is specified as a pipe insulation with mineral wool cement of equal thickness to the pipe insulation and finished with glass cloth.
5. PVC molding pipe fitting covers as manufactured by Zeston are acceptable.

- E. Piping Exposed to Outdoors and Pipes Subject to Freezing: Cover any piping subject to freezing with an additional layer of 2 in. glass fiber insulation of the same finish as specified for the particular service when not subject to freezing, but not less than 3 in. total thickness.
- F. Piping Exposed to Outdoors: Cover piping which is exposed to weather or called for to be weatherproof, in addition to insulation and finishes specified for piping exposed to outdoors, with a polished aluminum jacket similar to Johns-Manville "Metal-Lok" or approved equal, including all fittings.

PART 3 - EXECUTION

3.01 INSTALLATION OF INSULATION

- A. Perform all work in strict accordance with the manufacturer's recommendation and the best practice of the trade and the intent of this specification.
- B. Apply all insulation over clean dry surface, butting all sections or surfaces firmly together and finishing as hereinafter specified.
- C. Seal all vapor barriers continuous and throughout against moisture penetration.

3.02 PROTECTION OF INSULATION

- A. Protect pipe insulation at hangers, guides, and rollers by 16 gauge galvanized metal shields (at least 3 times the insulation diameter in length and 1/3 the insulation circumference in width) on the outside of the insulation and vapor barrier. Hold shields in place by straps. Do not pierce the insulation with hangers. Where glass fiber insulation is used on piping 3 in. and larger, provide half-section of calcium silicate covering of equal thickness at metal shields.
- B. Do not use staples on vapor barrier jackets.

END OF SECTION P15082

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SECTION P15141

DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Specialty valves.
2. Water meters furnished by utility company for installation by Contractor.
3. Water meters.
4. Escutcheons.
5. Sleeves and sleeve seals.
6. Wall penetration systems.

1.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Domestic water piping and support and installation shall withstand effects of earthquake motions determined according to ASCE/SEI 7.

1.4 SUBMITTALS

- A. Product Data: For the following products:

1. Specialty valves.
2. Transition fittings.
3. Dielectric fittings.
4. Flexible connectors.
5. Water meters.
6. Backflow preventers and vacuum breakers.
7. Escutcheons.
8. Sleeves and sleeve seals.
9. Water penetration systems.

- B. Water Samples: Specified in "Cleaning" Article.

- C. Coordination Drawings: For piping in equipment rooms and other congested areas, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:

1. Domestic water piping.
- D. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 61 for potable domestic water piping and components.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by City of New York or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 1. Notify Commissioner no fewer than five days in advance of proposed interruption of water service.
 2. Do not proceed with interruption of water service without Commissioner's written permission.

1.7 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.
 1. Cast-Copper Solder-Joint Fittings: ASME B16.18, pressure fittings.
 2. Wrought-Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
 3. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
 4. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
 5. Copper Pressure-Seal-Joint Fittings:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Elkhart Products Corporation; Industrial Division.
 - 2) NIBCO INC.
 - 3) Anvil International
 - 4) Or Approved Equal.

- b. NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber O-ring seal in each end.
- c. NPS 2-1/2 to NPS 4: Cast-bronze or wrought-copper fitting with EPDM-rubber O-ring seal in each end.

6. Grooved-Joint Copper-Tube Appurtenances:

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Anvil International.
 - 2) Shurjoint Piping Products.
 - 3) Victaulic Company.
 - 4) Or Approved Equal.
- b. Copper Grooved-End Fittings: ASTM B 75 copper tube or ASTM B 584 bronze castings.
- c. Grooved-End-Tube Couplings: Copper-tube dimensions and design similar to AWWA C606. Include ferrous housing sections, EPDM-rubber gaskets suitable for hot and cold water, and bolts and nuts.

2.3 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free, unless otherwise indicated; full-face or ring type unless otherwise indicated.
- B. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.4 TRANSITION FITTINGS

- A. General Requirements:
 - 1. Same size as pipes to be joined.
 - 2. Pressure rating at least equal to pipes to be joined.
 - 3. End connections compatible with pipes to be joined.
- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
- C. Sleeve-Type Transition Coupling: AWWA C219.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cascade Waterworks Manufacturing.
 - b. Dresser, Inc.; Dresser Piping Specialties.
 - c. Viking Johnson; c/o Mueller Co.
 - d. Orr Approved Equal.

2.5 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.
- B. Dielectric Unions:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. EPCO Sales, Inc.
 - b. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - c. Zurn Plumbing Products Group; Wilkins Water Control Products.
 - d. Or Approved Equal.
 2. Description:
 - a. Pressure Rating: 150 psig at 180 deg F (82 deg C).
 - b. End Connections: Solder-joint copper alloy and threaded ferrous.
- C. Dielectric Flanges:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Capitol Manufacturing Company.
 - b. EPCO Sales, Inc.
 - c. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - d. Or Approved Equal.
 2. Description:
 - a. Factory-fabricated, bolted, companion-flange assembly.
 - b. Pressure Rating: 150 psig minimum.
 - c. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
- D. Dielectric-Flange Kits:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Pipeline Seal and Insulator, Inc.
 - d. Or Approved Equal.
 2. Description:
 - a. Nonconducting materials for field assembly of companion flanges.
 - b. Pressure Rating: 150 psig.
 - c. Gasket: Neoprene or phenolic.
 - d. Bolt Sleeves: Phenolic or polyethylene.
 - e. Washers: Phenolic with steel backing washers.

E. Dielectric Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Calpico, Inc.
 - b. Lochinvar Corporation.
 - c. Zurn Plumbing Product Group
 - d. Or Approved Equal.
2. Description:
 - a. Galvanized-steel coupling.
 - b. Pressure Rating: 300 psig at 225 deg F.
 - c. End Connections: Female threaded.
 - d. Lining: Inert and noncorrosive, thermoplastic.

2.6 ESCUTCHEONS

- A. General: Manufactured ceiling, floor, and wall escutcheons and floor plates.
- B. One Piece, Cast Brass: Polished, chrome-plated finish with setscrews.
- C. One Piece, Deep Pattern: Deep-drawn, box-shaped brass with chrome-plated finish.
- D. One Piece, Stamped Steel: Chrome-plated finish with setscrew.
- E. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

2.7 SLEEVES

- A. Cast-Iron Wall Pipes: Fabricated of cast iron, and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc-coated, with plain ends.
- D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
 - I. Underdeck Clamp: Clamping ring with setscrews.

2.8 SLEEVE SEALS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Advance Products & Systems, Inc.
 2. Metraflex, Inc.
 3. Pipeline Seal and Insulator, Inc.

4. Or Approved Equal.
- B. Description: Modular sealing element unit, designed for field assembly, used to fill annular space between pipe and sleeve.
1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 2. Pressure Plates: Stainless steel.
 3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.9 WALL PENETRATION SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. SIGMA
 2. Metraflex Inc
 3. Thuderline
 4. Or Approved Equal.
- B. Description: Wall-sleeve assembly, consisting of housing and gland, gaskets, and pipe sleeve.
1. Carrier-Pipe Deflection: Up to 5 percent without leakage.
 2. Housing: Ductile-iron casting with hub, waterstop, anchor ring, and locking devices. Include gland, bolts, and nuts.
 3. Housing-to-Sleeve Gasket: EPDM rubber.
 4. Housing-to-Carrier-Pipe Gasket: AWWA C111, EPDM rubber.
 5. Pipe Sleeve: AWWA C151, ductile-iron pipe or ASTM A 53/A 53M, Schedule 40, zinc-coated steel pipe.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."
- C. Install shutoff valve immediately upstream of each dielectric fitting.
- D. Install domestic water piping level with 0.25 percent slope downward toward drain and plumb.
- E. Rough-in domestic water piping for water-meter installation according to utility company's requirements.
- F. Install seismic restraints on piping. Comply with requirements in Division 15 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment" for seismic-restraint devices.
- G. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.

- H. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- I. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- J. Install piping adjacent to equipment and specialties to allow service and maintenance.
- K. Install piping to permit valve servicing.
- L. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than system pressure rating used in applications below unless otherwise indicated.
- M. Install piping free of sags and bends.
- N. Install fittings for changes in direction and branch connections.
- O. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

3.2 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Braze Joints" Chapter.
- E. Soldered Joints: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- F. Copper-Tubing Grooved Joints: Roll groove end of tube. Assemble coupling with housing, gasket, lubricant, and bolts. Join copper tube and grooved-end fittings according to AWWA C606 for roll-grooved joints.
- G. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.
- H. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.3 VALVE INSTALLATION

- A. General-Duty Valves: Comply with requirements of local codes and authority having jurisdiction.

- B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.
- C. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
 - 1. Hose-End Drain Valves: At low points in water mains, risers, and branches.
 - 2. Stop-and-Waste Drain Valves: Instead of hose-end drain valves where indicated.
- D. Install balancing valve in each hot-water circulation return branch and discharge side of each pump and circulator. Set balancing valves partly open to restrict but not stop flow. Use ball valves for piping NPS 2 and smaller and butterfly valves for piping NPS 2-1/2 and larger.
- E. Install calibrated balancing valves in each hot-water circulation return branch and discharge side of each pump and circulator. Set calibrated balancing valves partly open to restrict but not stop flow.

3.4 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.
- B. Transition Fittings in Underground Domestic Water Piping:
 - 1. NPS 1-1/2 and Smaller: Fitting-type coupling.
 - 2. NPS 2 and Larger: Sleeve-type coupling.

3.5 DIELECTRIC FITTING INSTALLATION

- A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
- B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric couplings or nipples.
- C. Dielectric Fittings for NPS 2-1/2 to NPS 4 : Use dielectric flange kits.
- D. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.6 WATER METER INSTALLATION

- A. Rough-in domestic water piping for water meter installation, and install water meters according to utility company's requirements.
- B. Water meters will be furnished and installed by utility company.
- C. Install water meters according to AWWA M6, utility company's requirements, and the following:
- D. Install turbine-type water meters with shutoff valve on water-meter inlet. Install valve on water-meter outlet and valved bypass around meter unless prohibited by authorities having jurisdiction.
- E. Install fire-service water meters with shutoff valves on water-meter inlet and outlet and on full-size valved bypass around meter. Support meter, valves, and piping on brick or concrete piers.

- F. Install remote registration system according to standards of utility company and of authorities having jurisdiction.

3.7 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements in Division 15 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment" for seismic-restraint devices.
- B. Comply with requirements in Division 15 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support products and installation.
 - 1. Vertical Piping: MSS Type 8 or 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet If Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS 1-1/4 : 72 inches with 3/8-inch rod.
 - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 4. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
 - 6. NPS 6: 10 feet with 5/8-inch rod.
 - 7. NPS 8: 10 feet with 3/4-inch rod.
- F. Install supports for vertical copper tubing every 10 feet.
- G. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.8 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:

1. Domestic Water Booster Pumps: Cold-water suction and discharge piping.
2. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
3. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by plumbing code. Comply with requirements in Division 15 plumbing fixture Sections for connection sizes.
4. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.9 ESCUTCHEON INSTALLATION

- A. Install escutcheons for penetrations of walls, ceilings, and floors.
- B. Escutcheons for New Piping:
 1. Piping with Fitting or Sleeve Protruding from Wall: One piece, deep pattern.
 2. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One piece, cast brass with polished chrome-plated finish, stamped steel with set screw or spring clips.
 3. Bare Piping at Ceiling Penetrations in Finished Spaces: One piece, cast brass with polished chrome-plated finish.
 4. Bare Piping in Unfinished Service Spaces: One piece, cast brass with rough-brass finish] [stamped steel with set screw.
 5. Bare Piping in Equipment Rooms: One piece, cast brass stamped steel with set screw.
 6. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece floor plate.

3.10 SLEEVE INSTALLATION

- A. General Requirements: Install sleeves for pipes and tubes passing through penetrations in floors, partitions, roofs, and walls.
- B. Sleeves are not required for core-drilled holes.
- C. Permanent sleeves are not required for holes formed by removable PE sleeves.
- D. Cut sleeves to length for mounting flush with both surfaces unless otherwise indicated.
- E. Install sleeves in new partitions, slabs, and walls as they are built.
- F. For interior wall penetrations, seal annular space between sleeve and pipe or pipe insulation using joint sealants appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section "Joint Sealants" for joint sealants.
- G. For exterior wall penetrations above grade, seal annular space between sleeve and pipe using joint sealants appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section "Joint Sealants" for joint sealants.
- H. For exterior wall penetrations below grade, seal annular space between sleeve and pipe using sleeve seals specified in this Section.
- I. Seal space outside of sleeves in concrete slabs and walls with grout.

- J. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation unless otherwise indicated.
- K. Install sleeve materials according to the following applications:
 - 1. Sleeves for Piping Passing through Concrete Floor Slabs: Steel pipe.
 - 2. Sleeves for Piping Passing through Concrete Floor Slabs of Mechanical Equipment Areas or Other Wet Areas: Stack sleeve fittings.
 - a. Extend sleeves 2 inches above finished floor level.
 - b. For pipes penetrating floors with membrane waterproofing, extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 - 3. Sleeves for Piping Passing through Gypsum-Board Partitions:
 - a. Galvanized-steel sheet sleeves for pipes.
 - b. Exception: Sleeves are not required for water supply tubes and waste pipes for individual plumbing fixtures if escutcheons will cover openings.
 - 4. Sleeves for Piping Passing through Concrete Roof Slabs: Steel pipe.
 - 5. Sleeves for Piping Passing through Exterior Concrete Walls:
 - a. Cast-iron wall pipe sleeves.
 - b. Install sleeves that are large enough to provide 1-inch annular clear space between sleeve and pipe or pipe insulation when sleeve seals are used.
 - c. Do not use sleeves when wall penetration systems are used.
 - 6. Sleeves for Piping Passing through Interior Concrete Walls:
 - a. Steel pipe sleeves for pipes smaller than NPS 6.
 - b. Galvanized-steel sheet sleeves for pipes NPS 6 and larger.
- L. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements in Division 7 Section 07270 "Firestops and Smoke-seals" for firestop materials and installations.

3.11 SLEEVE SEAL INSTALLATION

- A. Install sleeve seals in sleeves in exterior concrete walls at water-service piping entries into building.
- B. Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble sleeve seal components and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.12 WALL PENETRATION SYSTEM INSTALLATION

- A. Install wall penetration systems in new, exterior concrete walls.
- B. Assemble wall penetration system components with sleeve pipe. Install so that end of sleeve pipe and face of housing are flush with wall. Adjust locking devices to secure sleeve pipe in housing.

3.13 IDENTIFICATION

- A. Identify system components. Comply with requirements in Division 15 Section "Identification for Plumbing Piping and Equipment" for identification materials and installation.
- B. Label pressure piping with system operating pressure.

3.14 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Piping Inspections:
 - 1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
 - 2. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
 - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
 - 3. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
 - 4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- C. Piping Tests:
 - 1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
 - 2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
 - 3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 - 4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - 5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
 - 6. Prepare reports for tests and for corrective action required.
- D. Domestic water piping will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

3.15 ADJUSTING

- A. Perform the following adjustments before operation:
 - 1. Close drain valves, hydrants, and hose bibbs.
 - 2. Open shutoff valves to fully open position.

3. Open throttling valves to proper setting.
4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide flow of hot water in each branch.
 - b. Adjust calibrated balancing valves to flows indicated.
5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.16 CLEANING

- A. Clean and disinfect potable and non-potable domestic water piping as follows:
 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
 2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- B. Clean non-potable domestic water piping as follows:
 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
 2. Use purging procedures prescribed by authorities having jurisdiction or; if methods are not prescribed, follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- C. Prepare and submit reports of purging and disinfecting activities.
- D. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.17 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Under-building-slab, domestic water, building service piping shall be:
 - 1. Hard drawn copper tube, ASTM B 88, Type K, wrought-copper solder-joint fittings; and brazed joints.
- E. Under-building slab fire-service-main piping shall be one of the following:
 - 1. Mechanical-joint, ductile-iron pipe; standard-pattern mechanical-joint fittings; and mechanical joints.
 - 2. Push-on-joint, ductile-iron pipe; standard-pattern push-on-joint fittings; and gasketed joints.
 - 3. Plain-end, ductile-iron pipe; grooved-joint, ductile-iron-pipe appurtenances; and grooved joints.
- F. Aboveground domestic water piping shall be:
 - 1. Hard drawn copper tube, ASTM B 88, Type L; cast- or wrought- copper solder-joint fittings; and brazed joints.

3.18 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 - 1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
 - 2. Throttling Duty: Use ball or globe valves for piping NPS 2 and smaller. Use butterfly or ball valves with flanged ends for piping NPS 2-1/2 and larger.
 - 3. Hot-Water Circulation Piping, Balancing Duty: Calibrated or Memory-stop balancing valves.
 - 4. Drain Duty: Hose-end drain valves.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.
- C. Iron grooved-end valves may be used with grooved-end piping.

END OF SECTION 15140

SECTION P15150

SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. This Section includes the following for soil, waste, and vent piping inside the building:
 - 1. Pipe, tube, and fittings.
 - 2. Special pipe fittings.
 - 3. Encasement for underground metal piping.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. EPDM: Ethylene-propylene-diene terpolymer rubber.
- C. LLDPE: Linear, low-density polyethylene plastic.
- D. NBR: Acrylonitrile-butadiene rubber.
- E. PE: Polyethylene plastic.
- F. PVC: Polyvinyl chloride plastic.
- G. TPE: Thermoplastic elastomer.

1.4 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water .
- B. Seismic Performance: Soil, waste, and vent piping and support and installation shall be capable of withstanding the effects of seismic events determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures."

1.5 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, and couplings.
- B. Field quality-control inspection and test reports.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.
- B. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

2.3 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Solvent Stack Fittings: ASME B16.45 or ASSE 1043, hubless, cast-iron aerator and deaerator drainage fittings.
- C. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
 - 1. Standard, Shielded, Stainless-Steel Couplings: CISPI 310, with stainless-steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve.
 - a. Manufacturers:
 - 1) ANACO.
 - 2) HUSKY
 - 3) Tyler Pipe; Soil Pipe Div.
 - 4) Clamp-All Corp.

- D. Rigid, Unshielded Couplings: ASTM C 1461, sleeve-type, reducing- or transition-type mechanical coupling molded from ASTM C 1440, TPE material with corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Manufacturers:
 - a. ANACO
 - b. Huskey
 - c. Tylen Pipe

2.4 SPECIAL PIPE FITTINGS

- A. Flexible, Nonpressure Pipe Couplings: Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition pattern. Include shear ring, ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Manufacturers:
 - a. Dallas Specialty & Mfg. Co.
 - b. Fernco, Inc.
 - c. NDS, Inc.
2. Sleeve Materials:
 - a. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - b. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

- B. Shielded Nonpressure Pipe Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Manufacturers:
 - a. Cascade Waterworks Mfg. Co.
 - b. Mission Rubber Co.
 - c. ANACO

- C. Rigid, Unshielded, Nonpressure Pipe Couplings: ASTM C 1461, sleeve-type reducing- or transition-type mechanical coupling molded from ASTM C 1440, TPE material with corrosion-resistant-metal tension band and tightening mechanism on each end.

1. Manufacturers:
 - a. ANACO
 - b. Huskey
 - c. Clamp-Au Corp

- D. Wall-Penetration Fittings: Compound, ductile-iron coupling fitting with sleeve and flexing sections for up to 20-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.

1. Manufacturers:

- a. SIGMA Corp
- b. Metraflex Inc
- c. Thunderline

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
- B. Aboveground, soil and waste piping shall be the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless cast-iron soil pipe and fittings heavy-duty shielded, stainless-steel and rigid, unshielded couplings; and hubless-coupling joints.
 3. Dissimilar Pipe-Material Couplings: Shielded, nonpressure pipe couplings for joining dissimilar pipe materials with small difference in OD.
- C. Aboveground, vent piping shall be any of the following:
1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless cast-iron soil pipe and fittings; standard, shielded, stainless-steel couplings; and hubless-coupling joints.
 3. Couplings: Shielded, nonpressure pipe couplings.

3.2 PIPING INSTALLATION

- A. Hanger and Support installation requirements are specified in Division 15 Section P15061 "Hanger and Supports for Plumbing Piping."
- B. Install seismic restraints on piping. Seismic-restraint devices are specified in Division 15 Section P15073 "Vibration and Seismic Controls for Plumbing Piping."
- C. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- D. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 15 Section "Basic Mechanical Materials and Methods."

- E. Install wall-penetration fitting at each service pipe penetration through foundation wall. Make installation watertight.
- F. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.
- G. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- H. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
 - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- I. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- J. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.3 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."
- B. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.

3.4 VALVE INSTALLATION

- A. General valve installation requirements are specified in Division 15 Section "Valves."

3.5 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are specified in Division 15 Section P15073 "Vibration and Seismic Controls for Plumbing Piping."
- B. Pipe hangers and supports are specified in Division 15 Section "Hangers and Supports." Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Install individual, straight, horizontal piping runs according to the following:

- a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet, if Indicated: MSS Type 49, spring cushion rolls.
- 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Install supports according to Division 15 Section P15061 "Hangers and Supports for Plumbing Piping."
 - D. Support vertical piping and tubing at base and at each floor.
 - E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.
 - F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 - 2. NPS 3 : 60 inches with 1/2-inch rod.
 - 3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
 - 4. NPS 6: 60 inches with 3/4-inch rod.
 - 5. NPS 8 to NPS 12: 60 inches with 7/8-inch rod.
 - G. Install supports for vertical cast-iron soil piping every 15 feet.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 - 4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.

3.7 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
 - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
 - C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
 - D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 1. Test for leaks and defects in new piping and parts of existing piping 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 piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
 5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 6. Prepare reports for tests and required corrective action.

3.8 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 15150

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SECTION P15160

STORM DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. This Section includes the following storm drainage piping inside the building:
 - 1. Pipe, tube, fittings and roof drains.
 - 2. Special pipe fittings.
 - 3. Encasement for underground metal piping.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. LLDPE: Linear, low-density polyethylene plastic.
- C. PE: Polyethylene plastic.
- D. PVC: Polyvinyl chloride plastic.
- E. TPE: Thermoplastic elastomer.

1.4 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working-pressure, unless otherwise indicated:
 - 1. Storm Drainage Piping: 10-foot head of water.
 - 2. Storm Drainage, Force-Main Piping: 50 psig .
- B. Seismic Performance: Soil, waste, and vent piping and support and installation shall be capable of withstanding the effects of seismic events determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures."

1.5 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, couplings and drains.
- B. LEED Submittal:

1. Product Data for Credit EQ 4.1: For solvent cements and adhesive primers, including printed statement of VOC content.
- C. Shop Drawings:
1. Design Calculations: Signed and sealed by a qualified professional engineer for selecting seismic restraints.
- D. Field quality-control inspection and test reports.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.
- B. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

2.3 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Extra-Heavy class.
- B. Gaskets: ASTM C 564, rubber.
- C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.4 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
1. Standard, Shielded, Stainless-Steel Couplings: CISPI 310, with stainless-steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve.

a. Manufacturers:

- 1) Husky.
- 2) Fernco, Inc.
- 3) Tyler Pipe; Soil Pipe Div.

2. Heavy-Duty, Shielded, Stainless-Steel Couplings: With stainless-steel shield, stainless-steel bands and tightening devices, and ASTM C 564, rubber sleeve.

a. Manufacturers:

- 1) Husky.
- 2) Clamp-All Corp.
- 3) Tyler Pipe; Soil Pipe Div.

2.5 STAINLESS-STEEL PIPE AND FITTINGS

- A. Pipe and Fittings: ASME A112.3.1, drainage pattern with socket and spigot ends.
- B. Gaskets: Lip seals shaped to fit socket groove, with plastic backup ring.
1. Material: EPDM, unless NBR is indicated.

2.6 ROOF DRAINS

A. Roof Drains:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - b. Watts Drainage Products Inc.
 - c. Zurn Plumbing Products Group; Specification Drainage Operation.
3. Standard: ASME A112.21.2M.
4. Pattern: Roof drain.
5. Body Material: Cast iron.
6. Combination Flashing Ring and Gravel Stop: Required.
7. Flow-Control Weirs: Not required.
8. Outlet: Bottom.
9. Dome Material: Stainless steel.
10. Extension Collars: Required.
11. Underdeck Clamp: Required.
12. Sump Receiver: Not required.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

- A. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
- B. Aboveground storm drainage piping shall be the following:
 - 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 - 2. Hubless cast-iron soil pipe and fittings; standard shielded, stainless-steel couplings; and coupled joints.
- C. Underground storm drainage piping shall be:
 - 1. Extra-heavy class, cast-iron soil pipe and fittings; gaskets; and gasketed calking materials; and calked joints.
- D. Aboveground storm drainage force mains [NPS 6 and SM Allen] shall be:
 - 1. Hard copper tube, Type K ; copper pressure fittings; and soldered joints.
- E. Underground storm drainage force mains [NPS 4 and smaller] shall be:
 - 1. Hard copper tube, Type K; pressure fittings; and soldered joints.
- F. Underground storm drainage force mains [NPS 5 and larger] shall be the following:
 - 1. Pressure pipe couplings if dissimilar pipe materials or piping with small difference in OD must be joined.
 - 2. Mechanical-joint, ductile-iron pipe; mechanical-joint, ductile-iron fittings; glands, gaskets, and bolts; and mechanical-joint joints.
 - 3. Push-on-joint, ductile-iron pipe; push-on-joint, ductile-iron fittings; gaskets; and gasketed joints.

3.3 PIPING INSTALLATION

- A. Hanger and Support installation requirements are specified in Division 15 Section P15061 "Hanger and Supports for Plumbing Piping."
- B. Install seismic restraints on piping. Seismic-restraint devices are specified in Division 15 Section P15073 "Vibration and Seismic Controls for Plumbing Piping."
- C. Install cleanouts at grade and extend to where building storm drains connect to building storm sewers.
- D. Install cleanout fitting with closure plug inside the building in storm drainage force-main piping.
- E. Install underground, force-main piping. Install encasement on piping according to ASTM A 674 or AWWA C105.

- F. Install underground, ductile-iron, force-main piping according to AWWA C600. Install buried piping inside building between wall and floor penetrations and connection to storm sewer piping outside building with restrained joints. Anchor pipe to wall or floor. Install thrust-block supports at vertical and horizontal offsets.
 - 1. Install encasement on piping according to ASTM A 674 or AWWA C105.
- G. Install underground, copper, force-main tubing according to CDA's "Copper Tube Handbook."
 - 1. Install encasement on piping according to ASTM A 674 or AWWA C105.
- H. Install underground, ductile-iron, special pipe fittings according to AWWA C600.
 - 1. Install encasement on piping according to ASTM A 674 or AWWA C105.
- I. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 15 Section "Basic Mechanical Materials and Methods."
- J. Install wall-penetration fitting system at each service pipe penetration through foundation wall. Make installation watertight.
- K. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.
- L. Make changes in direction for storm drainage piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- M. Lay buried building storm drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- N. Install storm drainage piping at the following minimum slopes, unless otherwise indicated:
 - 1. Building Storm Drain: 1 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Storm-Drainage Piping: 2 percent downward in direction of flow.
- O. Install force mains at elevations indicated.
- P. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- Q. Do not enclose, cover, or put piping into operation until it is inspected and approved by engineer of record.
- R. Install hangers for stainless-steel piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 2: 84 inches with 3/8-inch rod.
2. NPS 3: 96 inches with 1/2-inch rod.
3. NPS 4: 108 inches with 1/2-inch rod.
4. NPS 6: 10 feet with 5/8-inch rod.

- S. Install supports for vertical stainless-steel piping every 10 feet .

3.4 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 15 Section "Basic Mechanical Materials and Methods."
- B. Hub-and-Spigot, Cast-Iron Soil Piping Gasketed Joints: Join according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- C. Hub-and-Spigot, Cast-Iron Soil Piping Calked Joints: Join according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum calked joints.
- D. Hubless Cast-Iron Soil Piping Coupled Joints: Join according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.
- E. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.
- F. Grooved Joints: Cut groove ends of pipe and assemble grooved ends of pipes, grooved-end fittings, and grooved-end-piping couplings according to AWWA C606.

3.5 VALVE INSTALLATION

- A. General valve installation requirements are specified in Division 15 Section "Valves."
- B. Shutoff Valves: Install shutoff valve on each sump pump discharge.
 1. Install gate or full-port ball valve for piping NPS 2 and smaller.
 2. Install gate valve for piping NPS 2-1/2 and larger.
- C. Check Valves: Install swing check valve, between pump and shutoff valve, on each sump pump discharge.
- D. Backwater Valves: Install backwater valves in piping subject to backflow.
 1. Horizontal Piping: Horizontal backwater valves.
 2. Install backwater valves in accessible locations.

3.6 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are specified in Division 15 Section P15073 "Vibration and Seismic Controls for Plumbing Piping."
- B. Pipe hangers and supports are specified in Division 15 Section P15061 "Hangers and Supports for Plumbing Piping." Install the following:

1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 2. Individual, Straight, Horizontal Piping Runs: According to the following:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Install supports according to Division 15 Section "Hangers and Supports."
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.
- F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 2. NPS 3: 60 inches with 1/2-inch rod.
 3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
 4. NPS 6: 60 inches with 3/4-inch rod.
 5. NPS 8 to NPS 12: 60 inches with 7/8-inch rod.
 6. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.
- G. Install supports for vertical cast-iron soil piping every 15 feet.
- H. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4: 72 inches with 3/8-inch rod.
 2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 3. NPS 2-1/2: 108 inches with 1/2-inch rod.
 4. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
 5. NPS 6: 10 feet with 5/8-inch rod.
 6. NPS 8: 10 feet with 3/4-inch rod.
- I. Install supports for vertical copper tubing every 10 feet.
- J. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect storm drainage piping to roof drains and storm drainage specialties.
- D. Connect force-main piping to the following:

1. Storm Sewer: As shown on the contract document drawings.
2. Sump Pumps: To sump pump discharge.

3.8 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 1. Test for leaks and defects in new piping and parts of existing piping 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 piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced storm drainage piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Test Procedure: Test storm drainage piping on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 5. Prepare reports for tests and required corrective action.
- E. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 2. Cap and subject piping to static-water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 4. Prepare reports for tests and required corrective action.

3.9 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 15160

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SECTION 15165

STORM DRAINAGE PIPING SPECIALTIES

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 this Section.

1.2 SUMMARY

- A. This Section includes the following storm drainage piping specialties:
 - 1. Roof drains.
 - 2. Miscellaneous storm drainage piping specialties.
 - 3. Flashing materials.
- B. Related Sections include the following:
 - 1. Division 15 Section "Sanitary Waste Piping Specialties" for backwater valves, floor drains, trench drains and channel drainage systems connected to sanitary sewer, air admittance valves, FOG disposal systems, grease interceptors and removal devices, oil interceptors, and solid interceptors.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. FOG: Fats, oils, and greases.
- C. FRP: Fiberglass-reinforced plastic.
- D. HDPE: High-density polyethylene plastic.
- E. PE: Polyethylene plastic.
- F. PP: Polypropylene plastic.
- G. PUR: Polyurethane plastic.
- H. PVC: Polyvinyl chloride plastic.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

1.6 COORDINATION

- A. Coordinate size and location of roof penetrations.

PART 2 - PRODUCTS

2.1 ROOF DRAINS

A. Metal Roof Drains:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - a. Josam Company; Josam Div.
 - b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - c. Zurn Plumbing Products Group; Specification Drainage Operation.
3. Standard: ASME A112.21.2M.
4. Pattern: Roof and Scupper drain.
5. Body Material: Cast iron.
6. Combination Flashing Ring and Gravel Stop: Required.
7. Flow-Control Weirs: Not required.
8. Outlet: Bottom.
9. Dome Material: Cast iron.
10. Extension Collars: Required.
11. Underdeck Clamp: Required.
12. Sump Receiver: Not required.

2.2

A. Expansion Joints:

1. Standard: ASME A112.21.2M.
2. Body: Cast iron with bronze sleeve, packing, and gland.
3. End Connections: Matching connected piping.

4. Size: Same as connected piping.
- B. Downspout Boots:
1. Description: Manufactured, ASTM A 48/A 48M, gray-iron casting, with strap or ears for attaching to building; NPS 4 outlet; and shop-applied bituminous coating.
 2. Size: Inlet size to match downspout.
 3. Description: ASTM A 74, Service class, hub-and-spigot, cast-iron soil pipe.
 4. Size: Same as or larger than connected downspout.
- C. Conductor Nozzles:
1. Description: Bronze body with threaded inlet and bronze wall flange with mounting holes.
 2. Size: Same as connected conductor.

2.3 FLASHING MATERIALS

- A. Copper Sheet: ASTM B 152/B 152M, 12 oz./sq. ft. thickness.
- B. Zinc-Coated Steel Sheet: ASTM A 653/A 653M, with 0.20 percent copper content and 0.04-inch minimum thickness, unless otherwise indicated. Include G90 hot-dip galvanized, mill-phosphatized finish for painting if indicated.
- C. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil minimum thickness.
- D. Fasteners: Metal compatible with material and substrate being fastened.
- E. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.
- F. Solder: ASTM B 32, lead-free alloy.
- G. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to Division 15 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.
- B. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 2. Locate at each change in direction of piping greater than 45 degrees.

3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller per code requirements.
 4. Locate at base of each vertical soil and waste stack.
- C. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
 - D. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
 - E. Install trench drains at low points of surface areas to be drained. Set grates of drains flush with finished surface.
 - F. Assemble and install ASME A112.3.1, stainless-steel channel drainage systems according to ASME A112.3.1. Install on support devices so that top will be flush with surface.
 - G. Assemble non-ASME A112.3.1, stainless-steel channel drainage system components according to manufacturer's written instructions. Install on support devices so that top will be flush with adjacent surface.
 - H. Assemble FRP channel drainage system components according to manufacturer's written instructions. Install on support devices so that top will be flush with adjacent surface.
 - I. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions. Roofing materials are specified in Division 7.
 1. Install roof-drain flashing collar or flange so that there will be no leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
 2. Position roof drains for easy access and maintenance.
 - J. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
 - K. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.
 - L. Install cast-iron soil pipe downspout boots at grade with top of hub 6 inches above grade.
 - M. Install conductor nozzles at exposed bottom of conductors where they spill onto grade.
 - N. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
 - 1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft., 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.
 - 2. Copper Sheets: Solder joints of copper sheets.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
 - 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches , and skirt or flange extending at least 8 inches around pipe.
 - 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
 - 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 15165

No Text on This Page

SECTION P15183

ELECTRICAL PIPE HEATING CABLE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. General Provisions for Section 15010, applies to work of this Section.
- C. The requirements of this section apply to insulation for plumbing and piping equipment specified elsewhere in the specification.

1.02 DESCRIPTION OF WORK

- A. The work includes providing of all labor, supervision, materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner, all electrical pipe heating cable for freeze protection in accordance with Drawings and Specifications.
- B. Provide all components and controls to automatically protect pipes from freezing.

1.03 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of insulation of types and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years. Provide products UL listed for the specific purpose of use produced by a manufacturer listed as an acceptable Manufacturer in this section.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's data including printed technical literature, installation, instructions, and catalog cuts for each type of heating cable.
- B. Fabrication instructions for pipe freeze protection.
- C. Coordinated drawings of all required power junction box locations for use by Contractor.

PART 2 - PRODUCTS

- 2.01 The self-regulating heater shall consist of two (2) 16 AWG tinned-copper bus wires embedded in parallel in a self-regulating polymer core that varies its power output to respond to temperature all along its length, allowing the heater to be crossed over itself without overheating, to be used directly on plastic pipe, and to be cut to length in the field. The heater shall be covered by a radiation cross-linked modified polyolefin dielectric jacket, and have an outer braid of tinned-copper and an outer jacket of modified polyolefin. For plastic pipes, NEC requires use of a GFI circuit breaker. GFI shall have 30mA trip level.
- 2.02 In order to provide energy conservation and to prevent overheating, the heater shall have a self-regulating factor of at least 90%. The self-regulation factor is defined as the percentage reduction, without thermostatic control, of the heater output going from 40°F pipe temperature operation to 150°F pipe temperature operation.
- 2.03 The heater shall operate on line voltage of 208 volts without the use of transformer.

- 2.04 The heater shall be sized according to the manufacturer's recommendation for particular pipe size and insulation thickness of 1" fiberglass at the minimum ambient temperature. The minimum ambient temperature shall be -10°F. The heater output rating is to be given in watts per foot at 50°F.
- 2.05 The heater shall be XL-Trace as manufactured by Raychem Corporation.
- 2.06 Power Corporation, end seal, splice and tee kits components shall be applied in the field per manufacturer's instructions.
- 2.07 The system shall be controlled by an ambient sensing thermostat (Model AMC-1A) set at 40°F through an appropriate contactor. All pipes shall be controlled by a minimum number of thermostats as indicated on the drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Apply the heater linearly on the pipe after piping has been successfully pressure tested. Secure the heater to piping with cable ties or fiberglass tape.
- B. Apply "electric traced" signs to the outside of the thermal insulation.
- C. The thermostat shall be installed in the coldest location possible. Avoid installation near vents, steam lines or other heated locations.

3.02 TESTS

- A. After installation and before and after installing the thermal insulation, subject heater cable to testing using a 2500 VDC megger. Minimum insulation resistance should be 20 to 1000 megohms regardless of length.

END OF SECTION

SECTION P15410

PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. This Section includes the following conventional plumbing fixtures and related components:

1. Faucets for lavatories.
2. Flushometers.
3. Toilet seats.
4. Protective shielding guards.
5. Fixture supports.
6. Water closets.
7. Urinals.
8. Lavatories.
9. Service sinks.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.
- C. Cast Polymer: Cast-filled-polymer-plastic material. This material includes cultured-marble and solid-surface materials.
- D. Cultured Marble: Cast-filled-polymer-plastic material with surface coating.
- E. Fitting: Device that controls the flow of water into or out of the plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, shower heads and tub spouts, drains and tailpieces, and traps and waste pipes. Piping and general-duty valves are included where indicated.
- F. FRP: Fiberglass-reinforced plastic.
- G. PMMA: Polymethyl methacrylate (acrylic) plastic.
- H. PVC: Polyvinyl chloride plastic.
- I. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

1.4 SUBMITTALS

- A. **Product Data:** For each type of plumbing fixture indicated. Include selected fixture and trim, fittings, accessories, appliances, appurtenances, equipment, and supports. Indicate materials and finishes, dimensions, construction details, and flow-control rates.
- B. **Shop Drawings:** Diagram power, signal, and control wiring.
- C. **Operation and Maintenance Data:** For plumbing fixtures to include in emergency, operation, and maintenance manuals.
- D. **Warranty:** Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. **Source Limitations:** Obtain plumbing fixtures, faucets, and other components of each category through one source from a single manufacturer.
 - 1. **Exception:** If fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for that category.
- B. **Electrical Components, Devices, and Accessories:** Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. **Regulatory Requirements:** Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities" Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.
- D. **Regulatory Requirements:** Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.
- E. **NSF Standard:** Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- F. **Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.**
- G. **Comply with the following applicable standards and other requirements specified for plumbing fixtures:**
 - 1. **Enameled, Cast-Iron Fixtures:** ASME A112.19.1M.
 - 2. **Porcelain-Enameled, Formed-Steel Fixtures:** ASME A112.19.4M.
 - 3. **Slip-Resistant Bathing Surfaces:** ASTM F 462.
 - 4. **Solid-Surface-Material Lavatories and Sinks:** ANSI/ICPA SS-1.
 - 5. **Stainless-Steel Commercial, Handwash Sinks:** NSF 2 construction.
 - 6. **Vitreous-China Fixtures:** ASME A112.19.2M.
 - 7. **Water-Closet, Flush Valve, Tank Trim:** ASME A112.19.5.
 - 8. **Water-Closet, Flushometer Tank Trim:** ASSE 1037.
- H. **Comply with the following applicable standards and other requirements specified for lavatory and sink faucets:**
 - 1. **Backflow Protection Devices for Faucets with Side Spray:** ASME A112.18.3M.
 - 2. **Backflow Protection Devices for Faucets with Hose-Thread Outlet:** ASME A112.18.3M.
 - 3. **Diverter Valves for Faucets with Hose Spray:** ASSE 1025.

4. Faucets: ASME A112.18.1.
 5. Hose-Connection Vacuum Breakers: ASSE 1011.
 6. Hose-Coupling Threads: ASME B1.20.7.
 7. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
 8. NSF Potable-Water Materials: NSF 61.
 9. Pipe Threads: ASME B1.20.1.
 10. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
 11. Supply Fittings: ASME A112.18.1.
 12. Brass Waste Fittings: ASME A112.18.2.
- I. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:
1. Atmospheric Vacuum Breakers: ASSE 1001.
 2. Brass and Copper Supplies: ASME A112.18.1.
 3. Manual-Operation Flushometers: ASSE 1037.
 4. Brass Waste Fittings: ASME A112.18.2.
 5. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.
- J. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Flexible Water Connectors: ASME A112.18.6.
 2. Floor Drains: ASME A112.6.3.
 3. Pipe Threads: ASME B1.20.1.
 4. Toilet Seats: ANSI Z124.5.
 5. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.6 WARRANTY

- A. Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace components of whirlpools that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Structural failures of unit shell.
 - b. Faulty operation of controls, blowers, pumps, heaters, and timers.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal use.
 2. Warranty Period for Commercial Applications: Five years from date of Substantial Completion.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Faucet Washers and O-Rings: Equal to 10 percent of amount of each type and size installed.
 2. Faucet Cartridges and O-Rings: Equal to 5 percent of amount of each type and size installed.
 3. Flushometer Valve, Repair Kits: Equal to 10 percent of amount of each type installed, but no fewer than 12 of each type.
 4. Provide hinged-top wood or metal box, or individual metal boxes, with separate compartments for each type and size of extra materials listed above.

5. Flushometer Tank, Repair Kits: Equal to 5 percent of amount of each type installed, but no fewer than 2 of each type.
6. Water-Closet Tank, Repair Kits: Equal to 5 percent of amount of each type installed.
7. Toilet Seats: Equal to 5 percent of amount of each type installed.

PART 2 - PRODUCTS

2.1 WATER CLOSETS

- A. Manufacturers: Subject to Compliance with requirements. Provide product by one of the following:
 1. Kohler.
 2. American Standard.
 3. Crane Plumbing
- B. Description: Floor-mounted, vitreous china, elongated bowl. ADA minimum height of 17" – 19" to top of seat met with 16 ½" china height. Contractor shall verify installation conditions and compatibility of all elements prior to placing order.
 1. Fixture: Kohler "Highcrest" K-4302-0.
 2. Seat: Kohler K-4670-CA-0.
 3. Flush Valve: Kohler K-10962-CP.

2.2 LAVATORIES

- A. Manufacturers: Subject to Compliance with requirements. Provide product by one of the following:
 1. Kohler.
 2. American Standard.
 3. Dyson
- B. Description: Wall mount, vitreous china, 20" x 18", 8" centers, with overflow. Provide chair carrier with concealed arms. Mount 34" above finished floor for ADA compliance. Contractor shall verify installation conditions and compatibility of all elements prior to placing order.
 1. Fixture: Kohler "Soho" K-2053/white.
 2. Faucet: Dyson "Airblade Tap", AB09 Short
 3. Hot water and drain pipes under lav shall be configured to protect against contact. If contractor demonstrates that adequate configuration cannot be provided, pipes shall be insulated.
 4. McGuire Fig. No. 155 LAT offset tail-piece, or equal, at all handicap lavatories or pre-wrapped insulation.

2.3 STAFF KITCHEN SINK

- A. Manufacturers: Subject to Compliance with requirements. Provide product by one of the following:
 1. Kohler.
 2. JUST
 3. ELKAY
- B. Fixture: Elkay LRAD (or Q; reqd mounting system to be verified by contractor); 6 1/2" deep bowl; 3-holes. Provide CB1516 cutting board. Use Elkay drain fitting LK99, if spec'd Kohler item not compatible. Contractor to confirm compatibility of specified faucet and fittings with sink.
- C. Faucet: Kohler K-649-VS and K-1895-C-VS soap dispenser and all other accessories required for installation.

2.4 FIXTURE SUPPORTS

- A. Manufacturers: Subject to Compliance with requirements. Provide product by one of the following:
 - 1. J.R. Smith
 - 2. Zurn Industries
 - 3. WADE.
- B. Provide all hangers, supports, brackets, etc., for the proper installation of water closet, lavatories, and sinks, etc., requiring support. Supports to be in accordance with the manufacturers recommendations and when built into partition or walls, to be set as the construction progresses. Carriers/supports shall be completely concealed.

2.5 DRINKING FOUNTAIN

- A. Manufacturers: Subject to Compliance with requirements. Provide product by one of the following:
 - 1. ELKAY
 - 2. Halsey Taylor
 - 3. Haws
- B. Fixture: ELKAY Soft Sides, stainless steel, wall mount ADA Fountain EDFP214C and all other accessories required for installation. PROVIDE CONCEALED WALL GROUNDING as required.

2.6 PROTECTIVE SHIELDING GUARDS

- A. Protective Shielding Pipe Covers:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. McGuire Manufacturing Co., Inc.
 - b. Pluberex Specialty Products, Inc.
 - c. Zurn Plumbing Products Group; Tubular Brass Plumbing Products Operation.
 - 3. Description: Manufactured Plastic wraps for covering plumbing fixture hot-water supply and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before plumbing fixture installation.
- B. Examine cabinets, counters, floors, and walls for suitable conditions where fixtures will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.
- B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.
 - 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
 - 2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
 - 3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.
- C. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.
- D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.
- E. Install wall-mounting fixtures with tubular waste piping attached to supports.
- F. Install floor-mounting, back-outlet water closets attached to building floor substrate and wall bracket and onto waste fitting seals.
- G. Install counter-mounting fixtures in and attached to casework.
- H. Install fixtures level and plumb according to roughing-in drawings.
- I. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
 - 1. Exception: Use ball, gate, or globe valves if supply stops are not specified with fixture.
- J. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- K. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- L. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- M. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.
- N. Install toilet seats on water closets.
- O. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- P. Install water-supply flow-control fittings with specified flow rates in fixture supplies at stop valves.
- Q. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- R. Install shower flow-control fittings with specified maximum flow rates in shower arms.
- S. Install traps on fixture outlets.

1. Exception: Omit trap on fixtures with integral traps.
 2. Exception: Omit trap on indirect wastes, unless otherwise indicated.
- T. Install dishwasher air-gap fitting at each sink indicated to have air-gap fitting. Install on countertop at sink. Connect inlet hose to dishwasher and outlet hose to disposer.
- U. Install hot-water dispensers in back top surface of sink or in countertop with spout over sink.
- V. Install escutcheons at piping wall ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings. Escutcheons are specified in Division 15 Section "Basic Mechanical Materials and Methods."
- W. Set shower receptors and service basins in leveling bed of cement grout. Grout is specified in Division 15 Section "Basic Mechanical Materials and Methods."
- X. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Sealants are specified in Division 7 Section "Joint Sealants."

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- C. Ground equipment according to Division 16 Section 16060 "Grounding and Bonding."
- D. Connect wiring according to Division 16 Section 16120 "Wires and Cables 600 Volt and Below."

3.4 FIELD QUALITY CONTROL

- A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.
- B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.
- C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.
- D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.
- E. Install fresh batteries in sensor-operated mechanisms.

3.5 ADJUSTING

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- B. Operate and adjust hot-water dispensers and controls. Replace damaged and malfunctioning units and controls.

- C. Adjust water pressure at faucets and flushometer valves to produce proper flow and stream.
- D. Replace washers and seals of leaking and dripping faucets and stops.
- E. Install fresh batteries in sensor-operated mechanisms.

3.6 CLEANING

- A. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Do the following:
 - 1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
 - 2. Remove sediment and debris from drains.
- B. After completing installation of exposed, factory-finished fixtures, faucets, and fittings, inspect exposed finishes and repair damaged finishes.

3.7 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by the City of New York.

END OF SECTION 15410

SECTION 16010

GENERAL PROVISIONS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The requirements of the Contract Documents, including the General Conditions and Supplementary General Conditions, apply to the work of this division.
- B. In case of conflict between these General Provisions and the DDC General Conditions and/or DDC Supplementary General Conditions the more restrictive requirements govern.
- C. Drawings are diagrammatic and are a graphic representation of contract requirements to the best available standards at the scale required.
- D. Light and power and system riser diagrams and schematic diagrams generally indicate equipment connections to be used for various systems. Provide system conduit and wiring as required for actual systems installed on this project. Provide all work shown on diagrams whether or not it is duplicated on the plans.
- E. Specifications include incomplete sentences. Words or phrases such as "the contractor shall," "shall be," "furnish," "provide," "a," "an," "the," and "all" have been omitted for brevity.
- F. Except where modified by a specific notation to the contrary, the indication and/or description of any item, in the Drawings of Specification or both, carries with it the instruction to furnish and install the item complete with all appurtenances or accessories necessary to complete any required system, regardless of whether or not this instruction is explicitly stated as part of the indication or description.
- G. Specifications and Drawings are complimentary and are to be taken together for a complete interpretation of the work.
- H. Drawings of necessity utilize symbols and schematic diagrams to indicate various items of work. Neither of these have any dimensional significance nor do they delineate every item required for the intended installation. Install the work in accordance with the diagrammatic intent expressed on the electrical and mechanical drawings, and in conformity with the dimensions indicated on final architectural and structural working drawings and on equipment shop drawings.
- I. Certain details appear on the drawings which are specific with regard to the dimensioning and positioning of the work. These details are intended only for the purpose of establishing general feasibility. They do not obviate field coordination for the indicated work.
- J. Derive information as to the general construction from structural and architectural drawings and specifications.

1.2 QUALITY ASSURANCE AND STANDARDS

- A. Make the complete installation in accordance with the applicable requirements and standards of National Electrical Manufacturers Association (NEMA), National Fire Protection Association (NFPA), New York City Amendments to the 2002 National Electric Code, National Electrical Code (NEC) 2002, Institute of Electrical and Electronic Engineers (IEEE), American National Standard Institute (ANSI), Occupational Safety and Health Administration (OSHA), National Electrical Safety Code (NESC), Insulated Cable Engineers Association (ICEA), Underwriters Laboratories (UL), Factory Mutual (FM), Factory Insurance Association (FIA), National Electrical Contractors Association (NECA) "Standard of Installation," local inspection agency, local power company, local telephone company, along with state and local municipal codes and all applicable codes and authorities having jurisdiction. Refer to the Commissioner for decisions on any items or requirements noted in the Specifications or on Drawings, which conflict with the standards listed above. Provide all work necessary to comply with these requirements at no extra cost to the City of New York.
- B. Provide electrical equipment, materials and appliances which have the listing of Underwriters Laboratories, Inc., and bear labels attesting to UL listing approved by Municipal Departments having jurisdiction.

1.3 ORGANIZATION OF THE WORK

- A. Put work in place as fast as possible to meet all construction schedules.
- B. Keep a competent superintendent in charge of the work. Replace such superintendent if unsatisfactory to the City of New York.
- C. Maintain a complete file of Contract and shop drawings at the Site available for inspection by Commissioner. Upon installation, initial and date shop drawings.
- D. Provide every facility to permit inspection or observation of the work by Commissioner during the course of construction.
- E. Be responsible for work until its completion and final acceptance; replace any of the same which may be damaged, lost or stolen, without additional cost to the City of New York.

1.4 ACCEPTANCE OF THE WORK

- A. Make all workmanship, equipment and materials supplied under this contract acceptable to the City of New York and his Representatives, who have the power to reject any items which in their judgment are not in full accordance with the Drawings and Specifications.

1.5 PERMITS, CERTIFICATES, AND FEES

- A. Obtain and deliver a final Certificate of Approval from the applicable inspection Commissioner having jurisdiction. Make delivery to the Commissioner for transmittal to the City of New York upon completion of the work and before final payment. Pay all charges made by the inspection Commissioner and include their cost in the bid.

- B. Include the procurement of and payment for all permits, certificates and fees for the performance of the electrical work in compliance with codes, applicable laws and municipal regulations including those from local utilities for services and authorities having jurisdiction.

1.6 SCOPE OF WORK

- A. The Specifications and the accompanying drawings are intended to secure the provisions of all material, labor, equipment, and services necessary to install complete, test, and ready for operation the Electrical Systems in accordance with the Specifications and Drawings. Provide all systems complete with necessary appurtenances and minor auxiliaries, including pull boxes, offsets to clear interferences, and supports which are not shown but are needed to make each system complete in every respect.

Provide all work described in the Specifications and not shown on the Drawings, or vice versa, in complete working order. If mention has been omitted of any item of work or material, necessary for completion of the system, then such items must be and are hereby included. The work includes but is not limited to the following:

1. Raceways and installation components.
2. Wire and cable.
3. Panelboards - lighting and distribution.
4. Overcurrent protection (fuses/circuit breakers).
5. Safety and disconnect switches.
6. Main switchboard, distribution equipment and metering assemblies.
7. Installation of motor controllers furnished under division 15000.
8. Control equipment.
9. Electric service system.
10. Power, control and alarm wiring systems.
11. Grounding system.
12. Lighting fixtures and installation of all lighting fixtures including fixtures furnished by others, transformers, exit signs, ballasts, bulbs, etc.
13. Wiring devices, cover plates, back boxes.
14. Telephone/data/television conduit systems, where required to achieve final design intent and complement architectural and esthetical design.
15. Line voltage only to heating cables, controllers and heat tracing.
16. Combination carbon monoxide detectors.
17. Standby Emergency Generator system, including but not limited to emergency distribution panels, accessory panel and connection of required accessories to this panel, automatic transfer switches and relays, required connection of selected loads to distribution system, critical muffler, etc.
18. Combination carbon monoxide detectors.
19. Security camera power and conduit systems.
20. Electrical provisions for life safety system.
21. Addressable smoke, sprinkler alarm life safety systems (LSS).
22. Testing.
23. Furnishing of access doors.
24. Furnishing and setting of all sleeves through the floors, roof and wall, where required including waterproofing and fireproof sealing and cap flashing.
25. All concrete work for pads (including housekeeping pads) bases. Housekeeping pads to extend 4-6 inches beyond dimensions of equipment and be 4 inches high. Provide pads for all floor mounted electrical equipment, unless otherwise noted.
26. Hardware, such as inserts, bolts, etc., associated with concrete pads.
27. Cutting associated with electrical work.
28. Patching and prime painting, where required for electrical equipment and installation, including required touch ups on equipment and devices, where required and/or directed by the Commissioner.
29. Provision for installation and removal of temporary light and power.
30. Exterior work including conduit, cable, exterior lighting and power etc.

31. Installation and re-furbishing of switchboard furnished by the City of New York.

1.7 EXAMINATION OF EXISTING CONDITIONS

- A. Verify all grades, elevations, dimensions, and clearances at the site.

1.8 SHOP DRAWINGS AND OTHER INFORMATION REQUIRED

- A. Submit a shop drawing submittal schedule delineating the sequencing of shop drawings and dates of submittal prior to submittal of shop drawings. Make submittals in accordance with schedule so as to cause no delay in the work or in the work of any other contractor.
- B. Prior to purchasing equipment or materials, submit a list of proposed manufacturers.
- C. Shop drawings which are submitted out of sequence or without supplemental information necessary for proper evaluation of the submission are subject to delays in processing.
- D. Shop drawings must bear the Contractor's stamp certifying:
1. That he has checked the submitted subcontractor's shop drawings.
 2. That the submitted shop drawing is fully coordinated with all interfacing trades and with other trades where interference may occur.
 3. That the submitted shop drawings are in conformance with the contract drawings.
- E. Prior to assembling or installing the work, submit the following for review:
1. Catalog information and factory assembly drawings, as required for a complete explanation and description of all fixtures, devices and items of equipment.
 2. Field installation drawings, as required to explain fully all procedures involved in erecting, mounting and connecting all items of equipment.
 3. Drawings indicating main conduit runs, risers, panelboards, switchboards, signal and miscellaneous cabinets, pull, splice and junction boxes with particular attention to information on concealed elements.
- F. Scale Composite Drawings: Provide layout of electrical work, including but not limited to, lighting fixtures, main conduit runs, panelboards, distribution equipment, pull boxes, etc., above the hung ceilings and in mechanical equipment room to the sheet metal subcontractor for inclusion on a scaled composite drawing. Composite drawing to include raceway sizes and elevation of all work. This contractor is required to sign off in the composite drawing attesting to the full coordination of the electrical work with all trades.
- G. Submit shop drawings of the following items to the Commissioners for acceptance:
1. Lighting switches, dimmers and receptacles
 2. Switch and receptacle plates
 3. Outlet boxes
 4. Lighting fixtures, lamps, ballasts
 5. Wire and cable.
 6. Conduit and conduit fittings
 7. Switchboards
 8. Panelboards
 9. Metering assemblies
 10. Riser diagrams
 11. Standby Emergency generator, accessories, etc.
 12. Disconnect switches and circuit breakers

13. Fuses
 14. Sprinkler and smoke alarm systems and devices
 15. Signal systems
 16. Pull boxes
 17. Layout of main electric service room, electric closets, metering closets.
 18. Distribution routing
 19. Additional items as requested by Commissioner
- H. Materials installed or work performed without acceptance of materials is done at the risk of the Contractor, and the cost of removal of such material or work which is judged unsatisfactory for any reason is at the expense of the Contractor.
- I. Documents will not be accepted for review unless:
1. Number of copies and type of paper complies with the requirements of the general conditions.
 2. Complete information pertaining to appurtenances and accessories is included.
 3. Submitted as a package where documents pertain to related items.
 4. Properly marked with service or function identification as related to the project, where they consist of catalog sheets displaying other items which are not applicable.
 5. Properly marked with external connection identification as related to the project where they consist of standard factory assembly or field installation drawings.
- J. Shop drawings and other submissions which are submitted for review will be returned with a Shop Drawing stamp indicating actions based on reviews that are made and Contractor's responses that may be necessary. Actions noted regarding "REVIEW" and "RESPONSE" portions of the shop drawing stamp are defined as follows:
1. Review Portion
 - a. Incomplete: Item submitted without Contractor's stamp as stated above.
 - b. No Exceptions Taken: Contractor may install the items submitted in conformance with the plans and specifications.
 - c. Rejected: Item submitted fails to meet criteria in specifications and/or drawings.
 - d. Note Marking: Notations made directly on the shop drawing submittal.
 2. Response Required by Contractor Portion
 - a. Confirm: Contractor to confirm that he will comply with comments made under item 1d above; if the Contractor agrees with the comments, proceed with the fabrication and installation.
 - b. Resubmit: Contractor to resubmit shop drawings for review based upon paragraphs 1a and 1c and may also be required to resubmit under paragraphs 1.

1.9 RECORD DRAWING

- A. Before commencing work, procure complete set of black and white prints of Contract Drawings.
- B. Maintain prints in field office and permanently record, in colored pencil, on such prints, at time of occurrence, deviations from Contract Drawings, due to:
 1. Field Coordination
 2. Addenda
 3. Bulletins
 4. Change Orders

- C. Make drawings available for Commissioner's periodic inspection and submit for review with As-Built Drawings.

1.10 AS-BUILT DRAWINGS

- A. Before commencing work, procure complete reproducible set of Contract Drawings.
- B. Neatly revise to conform to Record Drawings.
- C. Conspicuously indicate major deviations in Mechanical and Electrical Equipment Rooms and Closets by specific reference to shop drawings of these rooms and provide an accurate and complete record of the work as installed.
- D. Submit up-to-date "in progress" prints to Commissioner when requesting payment for work installed.
- E. Upon completion of work, submit signed and certified reproducible set of as As-Built and referenced Shop Drawings, along with drawing files in AutoCAD 2004 form and marked up prints of Record Drawings, to Commissioner for acceptance.

1.11 COORDINATION OF WORK WITH OTHER TRADES

- A. Coordinate the work of this division with the work of all other Contracts, the Utility Company, and the Telephone Company, and so arrange that there will be no delay in the proper installation and completion of any part or parts of each respective work wherein it may be interrelated with that of this Contract so that generally all construction work can proceed without delaying the completion of the project. Forward all communications of a coordinating nature to the Commissioner via the General Contractor.
- B. Examine contract drawings and specifications for all other trades relating to this project, verify all governing conditions at the site, and become fully informed as to the extent and character of the work required and its relation to other work in the building. No consideration will be granted for any alleged misunderstanding of the materials to be furnished for work to be done.
- C. Scaled and figured dimensions with respect to the items are approximate only; sizes of equipment have been taken from typical equipment items of the class indicated. Before proceeding with work, carefully check all dimensions and sizes and assume full responsibility for the fitting-in of equipment and materials to the building and to meet architectural and structural conditions.
- D. Coordinate work with other disciplines. Confer with other contractors whose work might affect this installation; and arrange all parts of this work and equipment in proper relation to the work and equipment of others, with the building construction and with architectural finish so that this work will harmonize in service, appearance, and function.
- E. Install exposed conduit or other types of raceway to provide the maximum amount of headroom but in no case install the raceway less than 5 feet above the finished floor. Install conduit concealed in areas where hung ceilings or other furred spaces are indicated.
- F. Refer to the Architectural and/or Interior Designer's Drawings for ceiling heights, locations and types of hung ceilings and furred spaces.
- G. Furnish to the Contractors for General Construction, detailed advance information regarding all requirements related to work under other Divisions and/or Sections. Furnish sizes, accurate data, and locations of any and all pads, pits, chases, sleeves, and slots through floor slabs, walls, foundations, ceilings, roof, and other special openings required for work under this Division.

- H. In a timely fashion, obtain reproducible drawings for trade coordination (provided by HVAC Contractor), indicate work and coordinate accordingly. Attend coordination meetings held in location and at frequencies in accordance with the directions of the General Contractor or Construction Manager/Commissioner. When coordination is complete to the satisfaction of the General Contractor, "sign-off" the coordination drawings.

1.12 DELIVERY AND RECEIVING

- A. The City of New York-furnished equipment will be delivered, crated or otherwise packaged to the site delivery point selected by the Construction Manager. This Contractor is responsible for accepting delivery of all City of New York -furnished items which are under his trade jurisdiction and place them in their final location.
- B. Where items cannot be immediately placed in their final position, this Contractor is responsible for storing and protecting all City of New York -furnished items until the time of their final installation. This contractor is responsible for the care and protection of the items until acceptance by the City of New York. Coordinate delivery of Utility Company furnished equipment with the delivery policy of that company.

1.13 PROTECTION, MAINTENANCE AND PRODUCT HANDLING OF ELECTRICAL EQUIPMENT

- A. Deliver and store electrical equipment at the site, properly packed and crated until finally installed. Store materials in spaces as designated by the General Contractor/Construction Manager. Investigate each space through which equipment must be moved. If necessary, have equipment shipped from manufacturer in crated sections of size suitable for moving through restricted spaces.
- B. Adequately protect uninstalled and installed equipment and materials against loss or stealing, damage caused by water, paint, fire, plaster, moisture, acids, fumes, dust or other environmental conditions, or physical damage, during delivery, storage, installation and shutdown conditions. Replace any damaged or stolen material without extra cost to the City of New York.
- C. Provide effective protection for all material and equipment against damage that may be caused by environmental conditions. Do no work when conditions of temperature in area or moisture on materials or substrates are not in accordance with material manufacturer's recommended conditions for installation.
- D. Maintain all equipment and systems installed, until final acceptance by the Commissioner and the City of New York. The operation of the equipment by the City of New York or his authorized representative does not constitute an acceptance of the work. Work will be accepted only after the Contractor has adjusted his equipment, demonstrated that it fulfills the requirements of the Drawings and Specifications, and has furnished all required certificates.
- E. Provide effective protection against damage for all materials and equipment during shipment, and storage at the Project Site. Cover all stored equipment to exclude dust and moisture. Place stored conduit on dunnage with appropriate weather cover and caps on exposed ends.
- F. After cabinets and boxes are installed, cover openings to prevent entrance of water and foreign materials. Close conduit openings with temporary metal or plastic caps, including those terminated in cabinets.
- G. Protect all rough and finished floors and other finished surfaces from damage which may be caused by construction materials and methods. Protect floors with tarpaulins, drip pans and oil-proof floor covering. Protect finished surfaces from welding and cutting splatters with baffles and splatter blankets. Protect finished surfaces from paint droppings, adhesive and other marring agents with drop cloths. Protect other surfaces with appropriate protective measures.

- H. Deliver materials to Project Site in manufacturer's original unopened containers with manufacturer's name and product identification clearly marked thereon.
- I. After completion of project, clean the exterior surfaces of equipment furnished in this Division including concrete residue.

1.14 EQUIPMENT AND MATERIALS

- A. Provide Equipment and Materials required for installation under the Specifications new and without blemish or defect. Provide equipment and materials which will meet with the acceptance of authorities having jurisdiction over the work. Where such acceptance is contingent upon having the products listed or labeled by Underwriters Laboratories Inc., or other test laboratory, provide products so listed or labeled. Where no specific indication as to the type or quality of material or equipment is indicated, furnish a first class standard article.
- B. Wherever a manufacturer of a product is specified and the terms "other approved" or "approved equal" or "equal" or "similar to" are used, the substituted item must conform in all respects to the specified item. Consideration will not be given to claims that the substituted item meets the performance requirements with lesser construction. Performance as delineated in schedules and in the Specifications indicate minimum performance. In many cases, equipment is oversized to allow for pick-up loads, derating and future loads which cannot be delineated under the minimum performance.
- C. Provide all equipment of one type (such as switchboards, panelboards, etc.) produced by one manufacturer.
- D. Substituted equipment where permitted and accepted must conform to space requirements. Replace at Contractor's expense any substituted equipment that cannot meet space requirements, whether accepted or not. Make any modifications of related systems as a result of substitutions at Contractor's expense.
- E. Note that shop drawings, or other information submitted in accordance with the requirements hereinbefore specified, do not assure that the Commissioner attests to the dimensional suitability of the material or equipment involved. Commissioner's failure to object to shop drawings does not invalidate the Drawings and Specifications if in conflict, unless a letter requesting such change is submitted and accepted on the Commissioner's letterhead.
- F. Substitutions of equipment for that listed on the schedules or designated by model number in the Specifications will not be considered if the item listed or described is not a regular cataloged item shown in the current catalog of the manufacturer and been successfully used for a period of not less than five years.

1.15 ACCESS DOORS IN FINISHED CONSTRUCTION

- A. Access doors as required for operation and maintenance of concealed equipment, valves, controls, pull boxes, etc., shall be provided by the General Contractor under another section of the specification.
- B. Coordinate and prepare a location, size, and function schedule of access doors required and deliver to a representative of the installing Trade and the Commissioner for acceptance.
- C. Provide doors minimum size 16 inches by 16 inches as manufactured by Karp Associates, Inland Steel Products "Milcor" or other Acceptable Manufacturer in accordance with the following schedule:

| <u>Location</u> | <u>Type</u> | <u>Catalog Number</u> |
|--------------------------------|---------------------------------------|-----------------------|
| Plaster Ceiling
for Plaster | Recessed Door Panel
Milcor Style B | Karp DSC-210-PL |

| | | |
|---|--|--------------------------------|
| Acoustical Tile Ceiling | Recessed Door Panel for Tile | Karp DSC-210-AT Milcor Style A |
| Plaster Wall | Non-Recessed Door Panel | Karp DSC-211 Milcor Style M |
| Drywall | Non-Recessed Door Panel | Karp DSC-214-M Milcor Style M |
| Ceramic Tile Door Panel | Non-Recessed Milcor Style M | Karp DSC-214-M |
| Masonry Wall | Milcor Style K Non-Recessed Door Panel | Karp DSC-211 Milcor Style M |
| 3-hour Rated Masonry Pipe or Duct Shaft | Non-Recessed Door Panel | Karp DSC-211-FRT |
| 1-1/2-Hour Rated Pipe or Duct Shaft | Non-Recessed Door Panel | Milcor Fire Rated |
| Lay-In Acoustical Panel | Not Required | |

- D. Factory paint doors and frames with a prime coat of corrosion resistant paint.
- E. Frames: Welded minimum 14-gauge steel, mitered corners ground smooth with anchors.
- F. Doors: Minimum 14-gauge steel, heavy hinges flush with frame, invisible when closed.

1.16 EQUIPMENT MOUNTING HEIGHTS

- A. Refer to Architectural and Interior Design Drawings, sections, wall elevations, details, schedules, etc., for all specific mounting heights of fixtures, wall mounted outlets, switches, equipment, etc. Where no mounting data is specifically noted, then mount equipment in accordance with the following unless otherwise noted. Coordinate and review with Commissioner for intended location prior to mounting. (Dimensions are above finished floor unless noted.)
 1. Receptacle, computer terminal or telephone outlet in walls, partitions or columns: 15 inches to centerline, unless otherwise noted. For other public areas, refer to Architectural and Interior Design Drawings. Long dimension vertical unless otherwise noted.
 2. Receptacles or telephone outlet in mechanical spaces, electric switchboard rooms, electric closets: garage; 4'-0" to centerline.
 3. Toggle switch outlet in walls, partitions or columns: 4'-0" to centerline.
 4. Individual motor starters: 5'-0" to centerline.
 5. Individual distribution system switching device (with or without overcurrent protection): 5'-0" to centerline.
 6. Group mounted motor starters: 6'-0" maximum to centerline of highest pushbutton or switching device handle, 1'-0" minimum to bottom of lowest enclosure.

7. Group mounted distribution system switching devices: 6'-0" maximum to centerline of highest switching device handle.
8. Panelboards: 6'-6" maximum to centerline of highest switching devices handle.
9. Strip cabinet or other cabinet containing no switching devices: 1'-0" minimum to bottom.
10. Wall exit sign: 7'-6" to centerline. When sign is over doors, coordinate with top of door frame and ceiling height. When space permits, mount bottom of sign 2" clear of door frame.
11. Outlet for any signal system device other than computer and fire alarm station requiring manual operation: 4'-0" to centerline.
12. Outlet for any signal system sounding device as required for device to clear underside of ceiling by 1" minimum.
13. Clock outlet: As required to clear underside of ceiling by 1" minimum.
14. No devices, outlets switches, etc., shall be permitted to be mounted half on one type wall surface and half in another. Mount devices, etc., entirely on same surface.

- B. Field instructions issued by the Commissioner take precedence over the above list.
- C. Mounting heights of pendent mounted lighting fixtures as directed in the field by the Commissioner.

1.17 LIMITING NOISE PRODUCED BY ELECTRICAL INSTALLATIONS

- A. Make all electrical equipment and work operate under all conditions of load without sound or vibration that is objectionable, in opinion of the Commissioner and the City of New York. Correct sound or vibration conditions considered objectionable in approved manner by electrical contractor at his expense.

1.18 TEMPORARY LIGHT AND POWER

- A. Provide temporary electric service including a separate night lighting system for watchman's tour and construction security.
- B. Bear the cost of keeping the temporary lighting system energized (including the cost of electric energy) 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 latest in the evening. This applies to all weekdays, Monday through Friday inclusive, which are established as regular working days for any trade working on the project, including such days which are a holiday for electricians but are a regular workday for any other trade and hold until completion and final acceptance of the work of the contract or until the services are terminated by instructions from the Commissioner.
- C. Security and Safety Lights: Energize at the end of each normal working day and de-energize at the start of each normal working day, the separate night watchman's security lighting system. Leave the system energized over Saturdays, Sundays and all union holidays.
- D. Provide all wiring, supports, lamp sockets, receptacle sockets and any other materials, supplies or equipment necessary for temporary light and power system.
- E. Provide branch circuit panels containing ground fault protection branch circuit breakers where ground fault protection is required by OSHA for temporary receptacle circuits.
- F. Install separate stringer circuits for lighting and receptacles. Provide one lamp socket and one duplex receptacle (or two single receptacles) for every 400 square feet of new general construction area (approximately 20 feet on centers). Furthermore, provide one lamp socket and one duplex receptacle every 20 feet along the peripheral walls of the construction areas for temporary conditions. Replace burned out lamps as required for as long as the temporary lighting system is maintained in operation.

- G. Provide sufficient supplementary temporary lighting to permit proper execution of the work, including but not limited to the following:
 - 1. Construction hoist landings.
 - 2. Stairways and stairway landings where existing illumination is inadequate due to alterations or construction.
 - 3. Interior rooms not covered with general construction area lighting.
- H. Provide power wiring to operate construction hoist. Provide fused disconnect switch at hoist location with fuse size, wiring size and disconnect as required.
- I. Provide 50 trailer extension cords, each 25 feet long, for use by various construction trades. Distribute cords as directed by Construction Manager and remove cords as directed.

1.19 TESTS AND ACCEPTANCE

- A. Before application for final acceptance of the work will be considered, perform and complete all tests deemed necessary to show proper execution of the work in the presence of the Commissioner and/or other parties who may have legal jurisdiction. Arrange scheduling of all testing procedures to suit the convenience of the Commissioner. As a minimum, provide all testing in accordance with National (International) Electrical Testing Association Acceptance Testing Specification for Electrical Power Distribution Equipment and Systems.
- B. Include the provision of any assistance (such as removal of panelboard trims and junction and pull box covers) deemed necessary by the Commissioner to demonstrate compliance with the requirements of the Drawings and Specifications.
- C. Where equipment, supplied separate from the electric work, is energized, controlled or otherwise made operative by electric work wiring systems, the Trade responsible for the equipment is responsible for conducting the testing and making available any electrical testing equipment necessary to provide the proper functional performance of such wiring system. The electrical work however, includes cooperation in such testing and providing personnel on an "as need basis" for any necessary electrical testing equipment.
- D. Insure that all components of the Systems, wired by this Trade including the controls, are operating satisfactorily before any of the work will be considered complete.
- E. Test installation for ground and short circuits. If test indicates inadequate insulation resistance, make corrections as directed by the Commissioner.
- F. Provide all instruments, labor or other facilities required for such tests.
- G. Correct any defects or deficiencies discovered in any of the electrical work.
- H. The duration of tests, as a minimum, will be as determined by all authorities having jurisdiction, but in no case less than the time prescribed.

1.20 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. After completion of all required equipment and system tests and unless specifically noted elsewhere in these specifications, provide at the City of New York's/resident engineer's convenience knowledgeable personnel and necessary equipment to reasonably instruct and demonstrate the operation and maintenance of said equipment and system. Arrange for the related manufacturer or authorized representative to assist with this orientation.

- B. After completion of all required equipment and system tests and unless specifically noted elsewhere in these specifications, provide at the City of New York's/resident engineer's convenience, knowledgeable personnel and necessary equipment to reasonably instruct and demonstrate the operation and maintenance of said equipment and system. Arrange for the related manufacturer or authorized representative to assist with this orientation.
- C. Before requesting acceptance of work, furnish 3 copies of a complete, approved (by resident engineer) instruction manual, typewritten or printed bound to the resident engineer for distribution.
- D. Include the following in the instruction manuals:
 - 1. Table of Contents
 - 2. Introduction - Explanation of manual and its use
 - 3. Description of system or equipment
 - a. Complete schematic drawings of all systems
 - b. Functional and sequential description of all systems.
 - 4. Systems operation
 - a. Operation procedures
 - b. All posted instruction charts
 - 5. Maintenance
 - a. Systems trouble-shooting charts
 - b. Procedures for checking out functions
 - c. Recommended list of spare parts
 - 6. Listing of manufacturers
 - 7. Manufacturer's data: Where multiple model, type and size listings are included, clearly and conspicuously indicate those that are pertinent to this installation.
 - a. Description - literature, drawings, illustrations, certified performance charts, technical data, etc.
 - b. Operation
 - c. Maintenance - including complete trouble-shooting charts
 - d. Parts list
 - e. Names, addresses and telephone numbers of recommended repair and service companies
 - f. Guarantee data

1.21 GUARANTEES AND CERTIFICATIONS

- A. Guarantee all work to be free from leaks or defects. Replace or repair, as directed by Commissioner, defective materials or workmanship, as well as damage to the work of the Trades resulting from same for the duration of stipulated guarantee periods.
- B. The duration of guarantee periods following the date of acceptance of the entire work is as follows:
 - 1. For work not otherwise specified, one year.
 - 2. For heating systems, one year plus any time necessary to include one continuous heating season, from November 1 to April 1.
 - 3. For air conditioning systems, one year plus any time necessary to include one continuous cooling season from May 1 to October 1.

- C. Submit certification attesting to the fact that specified performance and other criteria are met by all items of equipment.

1.22 SITE VISITS FOR OBSERVATION

- A. As the project progresses, the Commissioners, at their discretion, will perform site visits to observe the mechanical and electrical installations. At the conclusion of these site visits, punchlists will be issued to the appropriate Contractor for the deficiencies in the work of his trade. Complete all work and perform all corrective measures as required by the punchlists. After this corrective and completion work has been accomplished advise the Architect and the Engineer in writing that every item on the punchlists has been completed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 16010

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SECTION 16060

GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in Part 3 "Field Quality Control" Article, including the following:
 - 1. Ground rods.
 - 2. Ground rings.
 - 3. Grounding arrangements and connections for separately derived systems.
- C. Qualification Data: For testing agency and testing agency's field supervisor.
- D. Field quality-control test reports.
- E. Operation and Maintenance Data: For grounding to include the following in emergency, operation, and maintenance manuals:
 - 1. Instructions for periodic testing and inspection of grounding features at ground rings, grounding connections for separately derived systems based on NETA MTS, NFPA 70B and IEEE C2-2002 (ANSI).
 - a. Tests shall be to determine if ground resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if they do not.
 - b. Include recommended testing intervals.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the Inter National Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the Inter National Electrical Testing Association to supervise on-site testing specified in Part 3.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with UL 467 for grounding and bonding materials and equipment.
- D. Standards Compliance: Comply with requirements of applicable NYC Electrical Codes, NEC, UL and IEEE Standards pertaining to electrical grounding and bonding of systems, circuitry and equipment. Provide grounding and bonding products which are UL listed and labeled for their intended usage.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 1. Solid Conductors: ASTM B 3.
 2. Stranded Conductors: ASTM B 8.
 3. Tinned Conductors: ASTM B 33.
 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
- C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches (6 by 50 mm) cross section, unless otherwise indicated; with insulators.
- D. A. Service and distribution system: As per applicable electrical codes.
- E. B. Outdoor metallic equipment: Bare #1/0 stranded copper cable, unless otherwise noted.
- F. Main telephone service equipment: Insulated No. 2. copper.

2.2 GROUND CLAMPS

- A. Bronze solderless type with bronze screws suitable for receiving required or noted conductors.

2.3 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

- B. Inaccessible: Exothermic Cadweld Type Process.
- C. Accessible: Mechanical pressure type connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.

2.4 GROUNDING ELECTRODES

- A. Ground Rods: Zinc-coated, sectional type; 3/4 inch by 10 feet (19 mm by 3 m) in diameter.
 - 1. Backfill Material: Electrode manufacturer's recommended material.

2.5 INSTALLATION OF WIRE AND CABLE

- A. Provide wire and cable of sizes as indicated on drawings or as required by NEC, whichever is larger.
- B. Install with as few splices as possible.
- C. Suitably protect cable against damage during construction and replace or suitably repair if damaged.
- D. In exposed installations:
 - 1. Route along the webs of columns and beams, and in corners where possible for maximum physical protection.
 - 2. Route so as to be visible and accessible insofar as possible.
 - 3. Support at intervals of 3 feet or less with clamp-type supports.

PART 3 – EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 24 inches (600 mm) below grade.
 - 2. Duct-Bank Grounding Conductor: Bury 18 inches above duct bank when indicated as part of duct-bank installation.
- C. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus on insulated spacers 1 inch (25 mm), minimum from wall, 6 inches (150 mm) above finished floor, unless otherwise indicated.
 - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, down to specified height above floor, and connect to horizontal bus.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors.
3. Connections to Ground Rods: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.
8. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

E. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.
2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

A. Install electrical grounding and bonding systems as indicated in accordance with manufacturer's instructions, requirements of applicable standards, NECA's "Standard of Installation," and in accordance with recognized industry practices to ensure that installation complies with requirements and serves intended function.

B. All receptacle branch circuits, lighting branch circuits, and all feeders shall be provided with a separate grounding conductor installed in the same conduit as phase conductors.

- C. Coordinate as necessary to interface installation of electrical grounding and bonding system work with other work.
- D. Ground the electrical installation including, but not limited to, the following: electrical service system neutral, conduit system for light and power, switchgear housings, cabinets, cable tray housings and neutrals of transformers, motor frames, housings of alarm and control panels and associated devices, lighting fixtures, emergency distribution system, telephone system, smoke, sprinkler life safety system, communications and security system, motor control centers, individual starters and other non-current carrying metal parts of electrical equipment.
- E. From the ground bus assembly connect copper insulated cable in conduit to the building service ground grid, in galvanized steel conduit to cold water service pipe, and to building steel using a suitably sized ground clamps. Connect on the cold water pipe ahead of meter and shut off valve to receive the ground conductors.
- F. Service switchboards: At each main disconnect switch provide a copper equipment ground connection rated at not less than 20% of switch rating and connected on the line side of the removable link of the service neutral.
- G. Wherever flexible metal conduit is used for part of a conduit run, except lighting branch circuits under 6 feet, provide a grounding conductor in the conduit and connect to grounding bushings at each end of run.
- H. Where pull boxes contain barriers, provide a ground lug in each section.
- I. Install grounding conductors in all wiring where non-metallic conduit is used.
- J. Provide ground conductor from main telephone equipment and frame room to same grounding point that serves building equipment system ground.
- K. Terminate feeder and branch circuit insulated equipment grounding conductors with grounding lug, bus, or bushing.
- L. Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torque requirements are not indicated, tighten connections to comply with tightening torque values specified in UL 486A to assure permanent and effective grounding.
- M. Install braided type bonding jumpers with code-sized ground clamps on water meter piping to electrically bypass water meters.
- N. Route grounding connections and conductors to ground and protective devices in shortest and straightest paths as possible to minimize transient voltage rises.
- O. Apply corrosion-resistant finish to field-connections, buried metallic grounding and bonding products, and places where factory applied protective coatings have been destroyed, which are subjected to corrosive action.
- P. Install clamp-on connectors on clean metal contact surfaces, to ensure electrical conductivity and circuit integrity.
- Q. Make ground wires continuous without splices. Avoid soldered joints in any ground connection. Use solderless type connectors, clamps, etc.

- R. Ground interrupted metallic raceways with ground conductors connected to metallic raceway at each end.
- S. Bond all conductive piping systems in the buildings to the electrical system ground. Make bonding connections as close as practical to the water pipe or service equipment ground bar.
- T. Comply with Utility Company ground resistance requirements.
- U. Where expansion fittings occur, provide internal code size ground conductor terminating in adjacent pulling points with grounding bushings.
- V. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- W. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
 - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- X. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
- Y. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 - 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- Z. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- AA. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.

BB. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column, extending around the perimeter of building.

1. Install tinned-copper conductor not less than No. 2/0 AWG for ground ring and for taps to building steel.
2. Bury ground ring not less than 24 inches (600 mm) from building foundation.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

B. Perform the following tests and inspections and prepare test reports:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal and at individual ground rods. Make tests at ground rods before any conductors are connected.

- a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
- b. Perform tests by fall-of-potential method according to IEEE 81.

3. Prepare dimensioned drawings locating each test well, ground rod and ground rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

C. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
2. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).

D. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Commissioner promptly and include recommendations to reduce ground resistance.

END OF SECTION 16060

No Text on This Page

SECTION 16120

WIRES AND CABLES 600 VOLTS AND BELOW

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. General Provisions for Electrical Work, Section 16010, applies to work of this Section.
- C. The requirements of this section apply to wire and cable work specified elsewhere in these specifications.

1.2 DESCRIPTION OF WORK

- A. Work includes providing all wires, cables and connections, complete with all accessories in accordance with Drawings and Specifications and as required for a complete system. Wiring size referenced in this Section is AWG (B&S), except as noted. For special wiring for individual systems, refer to respective Section of these Specifications.

1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of wires, cables, and connections of types, sizes and ratings required, whose products have been in satisfactory use in similar service for not less than 3 years. Provide wires, cables, and connections produced by a manufacturer listed as an Acceptable Manufacturer in this section.
- B. Standards Compliance: Comply with requirements of applicable local codes, NEC, UL, NEMA, ICEA, IEEE, and ASTM Standards pertaining to wires, cables and connections.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturers' data on wires, cables and connectors.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. For Wire and Cable:
 - 1. American Insulated Wire Corp.
 - 2. Essex Group, Inc.
 - 3. Triangle PWC, Inc.
 - 4. Royal Electric

5. Carol Cable Company, Inc.
6. Southwire Company
7. Pyrotanax

B. For Electrical Connections

1. Burndy Corporation
2. American Electric Company
3. Ideal Industries, Inc.
4. Thomas and Betts Corp.
5. Appleton Electric
6. 3M Company
7. O-Z Gednez
8. Efcor Family of Company
9. Panduit Company
10. Mac Products, Inc.

2.2 WIRE AND CABLE

A. Conductors

1. Copper with conductivity of not less than 98% at 20°C.
2. For No. 10 and smaller, utilize ASTM standard solid copper.
3. For No. 8 and larger, utilize ASTM standard stranded copper.

B. Insulation

1. Rubber and thermoplastic insulation complying with ASTM and ICEA standards.
2. Types and application as follows:
 - a. THWN and THHN: For interior branch circuits and feeders.
 - b. THHN, THHW and HHW: In wiring channels of UL listed fixtures used as raceways.
 - c. THW and XHHW: - For incoming electric service.
 - d. THW and THWN: For feeders and branch circuits in raceways located underground, below slab, in concrete slabs, in masonry, in direct contact with earth and in permanently moist areas.
 - e. Mineral insulated (MI). Wiring for fire pump.

C. Wire Sizes

1. Minimum No. 12 for lighting and power; increase to minimum No. 10 at 120 volt and over 90 feet for a 15 amp circuit and over 60 feet for a 20 amp circuit.
2. Minimum No. 14 for control and alarm; increase to minimum No. 12 at 120 volt and over 60 feet.

D. Color Coding (Solid or Striped)

1. 120/208 volt system:
 - a. Black for A phase
 - b. Red for B phase
 - c. Blue for C phase
 - d. White for neutral

e. Green for ground

2. For control and signal circuits, utilize ICEA color code wherever possible; consistently color code to avoid confusion and permit easy identification of conductors. Do not use two or more wires of the same color in the same raceway.

E. Cables

1. Types and application as follows (use hospital grade where required):

- a. Metal Clad Cable, Type MC: 3 or 4 conductors complete with code size bare copper ground in the interstices; for flexible connections.
- b. Armored cable (BX): branch circuiting and flexible connections (not acceptable for feeders) with ground conductor.
- c. Mineral Insulated Cable
 - 1) Factory assembly of one or more conductors insulated with highly compacted magnesium oxide insulation, enclosed in a seamless, liquid, and gas tight continuous copper sheath.
 - 2) Conductors shall be solid, high electrical conductivity copper (suitable for equipment grounding purposes) with a cross sectional area corresponding to standard sizes.
 - 3) Insulation shall allow for proper spacing of conductors. Thickness on insulation shall be at least 55 mils for cable from 14 AWG through 250 MCM.
 - 4) Mineral insulated cable shall be classified by underwriters Laboratories as having a 2 hour fire resistive rating.
 - 5) Fittings shall be identified for such use.

2. With bushings on all cable ends or terminations.

F. Cable Supports and Spacers

1. Supports: OZ Gedney Type S or Type R as required.

G. Plenum

1. Type shall be in accordance with applicable standards.

H. Life Safety Systems

1. Type shall be in accordance with applicable standards.

2.3 ELECTRICAL CONNECTORS

- A. For each electrical connection indicated, provide complete assembly of materials, including but not limited to, pressure connectors, terminals (lugs), electrical insulating tape, electrical solder, electrical soldering flux, heat-shrinkable insulating tubing, cable ties, solderless wire-nuts, and other items and accessories as needed to complete splices and terminations to mate and match, including sizes and ratings with equipment terminals which are recommended by equipment manufacturer for intended applications.

- B. UL listed factory-fabricated, metal connector of sizes, ampacity ratings, materials, types and classes for application and for services indicated.

- C. Copper Conductors, No. 10 and Smaller: Compression type or twist-on spring connectors with nylon insulating cover.
- D. Copper Conductors No. 8 and Larger: Color keyed insulated compression connection.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions under which wires, cables and connections are to be installed. Notify Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install wires, cables and connectors as indicated, in accordance with manufacturer's written instructions, requirements of applicable Standards, UL, and NECA's "Standard of Installation," and in accordance with recognized industry practices to ensure that installation complies with requirements and serves intended function.
- B. Coordinate as necessary to properly interface installation of wires/cables with other work.
- C. Pull conductors simultaneously where more than one is being installed in same raceway.
- D. Use anti-seize compound for copper lug connections to bus bars.
- E. Use pulling compound or lubricant, where necessary; compound used must not deteriorate conductor or insulation.
- F. Use pulling means, including fish tape, cable, rope and basket weave wire/cable grips which will not damage cables or raceway.
- G. Do not exceed maximum pulling tension of wire and cable.
- H. Install exposed cable, parallel and perpendicular to surfaces, or exposed structural members, and follow surface contours, where possible.
- I. Complete conduit or raceway installation (joints made up tightly and the entire run secured in place) before pulling wire and cable.
- J. Do not pull thermoplastic wires at temperatures lower than 0 deg F.
- K. Support wires and cables at the upper end of all risers and at intermediate points as required by the applicable electrical codes.
- L. Seal, between the wire and conduit with a non-hardening compound approved for the purpose, cable and wire entering a building from underground where cable exits the conduit.
- M. Install cable spacers where required. Provide conduit fittings for spacing of cables at terminations, consisting of galvanized or cadmium plates, steel or malleable iron threaded conduit and fittings and inserts of non-metallic insulating material with openings adequate to accommodate cables being spaced.

- N. In certain systems, equipment furnished by an approved manufacturer may require a different number and arrangement of conductors from that indicated on the Drawings. In such cases, comply with such requirements at no additional cost to the City of New York.
- O. In wireways and large pull boxes, lace and tie off conductors in groups of 3 phases and neutral (if used) as installed in conduits to limit conductor unbalanced loading.
- P. Wiring at outlets. Install conductors at each outlet with at least 12 inches of slack. Stow loose ends neatly in outlet box.
- Q. Provide splices and taps in accessible boxes, panelboards fittings, gutters, terminal panels, etc., only. Provide materials compatible with the conductors, insulations and protective jackets on the cables and wires.
- R. Keep conductor splices to minimum.
- S. Install splices and taps which possess equivalent-or-better mechanical strength and insulation ratings than conductors being spliced. Use connectors which are compatible with conductor material.
- T. Tie all circuit and control wiring in cabinets, panels, pull boxes, and junction boxes.
- U. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486A and B.
- V. Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams. Mate and match conductors of electrical connections for proper interface between electrical power supplies and installed equipment.
- W. Cover splices with electrical insulating material equivalent to, or of greater insulation resistivity rating than, electrical insulation rating of those conductors being spliced.
- X. 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. Cut armored jackets with tools made specifically for that purpose.

3.3 FIELD QUALITY CONTROL

- A. Check for physical damage and proper connection in accordance with drawings.
- B. Megger conductors phase-to-phase and phase-to-ground for continuity and insulation tests before connection to utilization devices for the following:
 1. 100 percent of feeders.
 2. 10 percent of branch circuits.
 3. 100 percent of 3-phase motor branch circuits, 25 HP and over.
- C. Perform tests prior to connecting equipment and in presence of authorized representatives.
- D. Submit written reports of test results.
- E. Prior to energizing, test wires and cables for electrical continuity and for short circuits.

- F. Subsequent to wire and cable hook-ups, energize circuits and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected.

END OF SECTION 16120

SECTION 16130

RACEWAYS, BOXES AND FITTINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions sections, apply to work of this section.
- B. General Provisions for Electrical Work, Section 16010, applies to work of this section.
- C. The requirements of this section apply to raceways specified elsewhere in this specification.

1.2 DESCRIPTION OF WORK

- A. Work includes providing completely coordinated grounded raceway systems complete with boxes, fittings, supports, anchors, sleeves, hangers, clamps, straps, seals, flexible connections to vibrating equipment and accessories, as specified and as required for a complete system. Conduit or tubing sizes referred to in the specifications and on the Drawings are nominal internal diameters. Raceway is required for all wiring unless specifically indicated or specified otherwise.

1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of raceway systems, boxes and fittings of types and sizes required, whose products have been in satisfactory use in similar service for not less than 3 years. Provide raceways and boxes produced by a manufacturer listed as an Acceptable Manufacturer in this section.
- B. Standards Compliance: Comply with requirements of applicable local codes, NEC, UL and NEMA Standards pertaining to raceways, boxes and fittings. Provide raceways, boxes and components which have been UL listed and labeled.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data, including specifications and installation instructions, for each type of raceway system and box required. Include data substantiating that materials comply with requirements.
- B. Samples: Submit 6" length of exposed type surface raceways with required finish, in accordance with requirements of General Conditions.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. For Metallic Raceways
 - 1. Allied Tube & Conduit Corp.
 - 2. Wheatland Tube Company
 - 3. Triangle PWC, Inc.
 - 4. LTV.

- B. For Raceway Fittings and Accessories
 - 1. Appleton Electric Co.
 - 2. Thomas and Betts Co.
 - 3. O.Z. Gedney Electrical Manufacturing Co. Inc.
 - 4. Raco, Inc.
 - 5. Steel City (American Electric).

- C. For Outlet Boxes, Junction and Pull Boxes, and Floor Boxes.
 - 1. Appleton Electric Company.
 - 2. Crouse-Hinds Co.
 - 3. Hubbell Inc.
 - 4. O.Z. Electrical Manufacturing Co. Inc.
 - 5. RACO Div; Harvey Hubbell Inc.
 - 6. Steel City (American Electric).
 - 7. Thomas and Betts Co.

- D. For Fire Rated Poke Through
 - 1. Hubbell Inc.
 - 2. Steel City (American Electric).
 - 3. Walker.
 - 4. Wiremold Company.

- E. For Surface Metal Raceway
 - 1. Isoduct.
 - 2. Walker.
 - 3. Wiremold Company

2.2 RACEWAYS

- A. Rigid Steel Conduit (RSC): Full weight steel pipe hot dipped galvanized inside and outside, threaded, minimum 3/4 inch, unless otherwise noted; minimum 1/2 inch for switch legs.
- B. Intermediate Metal Conduit (IMC): Rigid intermediate grade, hot dipped galvanized outside, threaded, minimum 3/4 inch, unless otherwise noted; minimum 1/2 inch for switch legs.
- C. Electrical Metallic Tubing (EMT): Thin wall steel, galvanized, threadless, minimum 3/4 inch, unless otherwise noted; minimum 1/2 inch for switch legs.
- D. Flexible Steel Conduit: Continuous length of specially wound interlocked, galvanized strip steel, minimum 3/4 inch.

- E. **Liquid Tight Flexible Metal Conduit:** Continuous length of flexible interlocked, galvanized inside and outside steel tubing, with a continuous copper bonding conductor wound specially between the convolution, coated with a liquid tight jacket of flexible polyvinyl chloride (PVC), minimum 3/4 inch.
- F. **Wireways:** Steel, minimum No. 16 gauge thickness, with baked enamel finish, screw-on covers, conduit knockout, elbow fittings, hangers, wire retainers, and cabinet adapter; size as noted or required.

2.3 FITTINGS AND ACCESSORIES

A. General

- 1. Accessories as required including, but not limited to, bushings, knockout closures, locknuts, mounting brackets, device box extensions, switch box supports, plaster ears, and plasterboard expandable grip fasteners, which are compatible with device boxes being utilized to fulfill installation requirements for individual wiring situation.
- 2. Watertight couplings and connections in concrete and outdoors.
- 3. Die-cast fittings not permitted.
- 4. Grounding Bushings: With lug suitable for the size and type of grounding conductor to be terminated. Oz/Gedney type "BLG".

B. Rigid Steel and Intermediate Metal Conduit Fittings

- 1. Steel or malleable iron, standard threaded couplings, locknuts, bushings, and elbows.
- 2. UL listed conductive type thread compounds to insure low resistance ground continuity through conduit. Watertight couplings and connections in concrete.
- 3. Locknuts of the bonding type with sharp edges for digging into the metal wall of the enclosure.
- 4. Bushings of the metallic insulating type, consisting of an insulating insert molded or locked into the metallic body of the fitting.
- 5. Corrosion resistant metallic conduit fittings.
- 6. Sealing fittings of the threaded cast iron type. Where sealing fittings are used to prevent passage of water vapor, utilize the continuous drain type.

C. Electrical Metallic Tubing Fittings: Steel or malleable iron concrete tight couplings and connectors of the gland and ring compression type or set screw type. Indent type connectors are not permitted.

D. Flexible Metal Conduit Fittings: Steel or malleable iron, insulated throat angle wedge type.

E. Liquid tight flexible metal conduit fittings: Steel or malleable iron type incorporating a threaded grounding core steel or plastic compression ring gland for tightening, and an insulated throat.

F. Surface Metal Raceway Fittings: As recommended by manufacturer to match integrity of raceway system.

G. Expansion and Deflection Couplings

- 1. Comply with UL 467 and UL 514.
- 2. Accommodate 0.75 inch deflection, expansion and contraction in any direction.
- 3. Allow 30 degree angular deflection.
- 4. Include internal flexible metal braid sized to guarantee conduit ground continuity and fault currents.
- 5. Watertight, seismically qualified corrosion resistant threaded and compatible with associated conduit.
- 6. Jacket: Flexible, corrosion resistant, watertight, moisture and heat resistant molded rubber material with stainless steel jacket clamps.

H. Supports

1. Zinc coated or equivalent.
2. Conduit hangers, designed for the purpose and have pre-assembled closure bolt and nut and provision for receiving hanger rod.
3. Multiple conduit (trapeze) hangers not less than 1-1/2 inch by 1-1/2 inch, 12 gauge steel, cold formed, dipped clamps. Hanger rods not less than 3/8 inch diameter steel.
4. Anchors of types, sizes and materials designed for the purpose.
5. Provide conduit supports for life safety systems in accordance with New York City Building Code Seismic Requirements.

2.4 OUTLET BOXES

A. Outlet Boxes

1. Galvanized steel for concealed work, and galvanized cast iron or aluminum with threaded hubs for exposed work; boxes of shapes, cubic inch capacity, and sizes as required, suitable for installation at respective location.
2. With mounting holes and with cable and conduit size knockout openings.
3. With threaded screw holes, with corrosion resistant ridged cover and grounding screws for fastening surface and device type box covers, and for equipment grounding.
4. For concealed work, utilize 4 inch square or octagon outlet boxes, except as otherwise required by construction devices or wiring and as follows:
 - a. Above ceiling: 1-1/2 inch deep.
 - b. In ceiling or slab: 3 inch deep.
 - c. In wall for fixtures: 2-3/4 inch deep.
 - d. In wall for receptacles and switches: 1-1/2 inch deep.
 - e. With raised covers and fixture studs where required.
 - f. Back-to-back boxes type not permitted.
 - g. Gangable type boxes are not permitted.
 - h. For installation of more than two devices in a common outlet box, utilize boxes and device rings manufactured specifically for this purpose.
 - i. Outlet box device rings used to be of sufficient depth so as to make the use of extension boxes and rings unnecessary.
5. For exposed work utilize 4 inch round x 2 inch deep for mounting on ceilings and 4 inch square x 2 inch deep for mounting on walls, except as otherwise required by construction, devices, or wiring.
6. For outdoors and damp locations, utilize cast weatherproof outlet boxes with gasketed cast covers.
7. Provide blank covers for outlet boxes without devices. Covers to match adjacent plates. Style finish subject to approval by Commissioner.

2.5 JUNCTION AND PULL BOXES

- A. Galvanized sheet steel with screw-on covers for interior work, and galvanized cast iron and/or 12 gauge stainless steel with threaded hubs and gaskets for outdoors and damp locations; boxes of shapes, cubic inch capacity, and sizes as required, suitable for installation at respectable location.
- B. Insulated cable supports.

2.6 FLOOR BOXES

- A. Material: Cast iron with a gray polyester corrosion-resistant finish with a 6 inch long #12 AWG grounding pigtail prewired to the ground screw, with threaded conduit entrance and suitable to accept conduit and devices as indicated.
- B. Types:
 - 1. For concrete pour 3 inches and greater: Equal to Hubbell Dualevel Style B-2537.
 - 2. 3-Way Service Floor Box: Equal to Hubbell Style 3SFB-C.
- C. Covers: Brass or aluminum as selected by Commissioner, and suitable for indicated devices and mounting.
- D. Flanges: brass or aluminum as selected by Commissioner, and suitable for floor box.
- E. Style: square, round and number of gangs as selected by Commissioner.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions under which raceways, boxes, accessories, and fittings are to be installed and substrate which will support raceways. Notify Commissioner in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General

- 1. Install raceways, boxes, accessories, and fittings as indicated, in accordance with manufacturers' written installation instructions, requirements of applicable standards, and NECA's "Standard of Installation" and in accordance with recognized industry practices to ensure that installation complies with requirements and serves intended function.
- 2. Coordinate as necessary to interface installation of electrical raceways, boxes, and components with other work. Run raceways concealed, except as noted.
- 3. Mechanically fasten together metal conduits, enclosures, and raceways for conductors to form continuous electrical conductor. Connect to electrical boxes, fittings and cabinets to provide electrical continuity and firm mechanical assembly. Maintain grounding continuity of interrupted metallic raceways with ground conductor.
- 4. 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.
- 5. Support raceways by means of ceiling trapeze, strap hangers, wall brackets with back spacer, structural steel angles or channels. Support riser raceways at each floor. Secure raceways to supports with pipe straps or U-bolts.
- 6. Space supports as per applicable electrical code and per manufacturer's recommendations, unless otherwise indicated.

7. Mount supports to structure with toggle bolts on hollow masonry, expansion shields or inserts on concrete and brick, machine screws on metal, wood screws on wood. Nails, rawl plugs, wood, and/or plastic plugs are not permitted.
8. Keep raceways clear of motor foundations and from underside of boilers. Also, do not obstruct headroom, doorways, or walkways, with raceway.
9. Do not install conduit in terrazzo floors.
10. Install miscellaneous fittings such as reducers, chase nipples, 3-piece unions, split couplings, and plugs that have been specifically designed and manufactured for their particular application.
11. Use roughing-in dimensions of electrically operated equipment furnished by equipment supplier. Set conduit and boxes for connection to equipment only after receiving dimensioned drawings from equipment installer and after checking location with other trades.
12. Test conduits required to be installed, but left empty, with ball mandrel. Clear any conduit, which rejects ball mandrel.
13. Provide long radius bends for empty raceway systems where required to satisfy the system cabling requirements.
14. Install complete raceway runs before pulling in wire or cable. Install raceways so that required conductors may be drawn in without injury or excessive strain to raceway or cable. Where raceway size is not indicated, follow applicable code.
15. Keep end of raceways plugged or capped during construction.
16. Where located in slab, limit the maximum outside diameter of the conduit to 1/3 of the slab thickness. When locating in the slab, place conduits in a manner so as not to interfere with the placement of reinforcing bars or cause damage to the structural membrane or structural support.
17. Where located in concrete fill, provide a minimum of 1 inch cover for conduit.
18. For empty raceways over 10 feet long, provide fish or pull wire. For 1 1/2 inch and larger pull wire to consist of steel core nylon rope and terminal ball.
19. In cold rooms, walk-in refrigeration boxes, etc., weatherproof raceway installations and use sealing fittings and compounds at entries. Use conduit and cable sealing devices similar to O.Z. Gedney Types "CSB" or "CSM" and Crouse-Hinds E.Y.S.
20. Remove damaged or deformed raceways.
21. Do not support branch circuit conduits by the suspended ceiling or its supporting members, lighting fixtures, mechanical piping, or air conditioning ducts.
22. Conduits are not to cross pipe shafts or ventilating duct openings. Avoid present and future openings in floor, wall or ceiling construction, when so indicated on drawings.
23. Keep conduits a minimum distance of 18 inches from parallel runs of flues or boiler breeching and 6 inches from hot water pipes or other sources of heat. Wherever possible, install horizontal raceway runs above water and steam piping. Provide thermal insulation where these separations cannot be maintained.

24. Support riser conduit at each floor level with clamp hangers.
25. Use of running threads at conduit joints and terminations is prohibited. Where required, use 3-piece union or split coupling.
26. For conduits entering the building and for the manholes preceding the conduits entry to the building, perform the following:
 - a. Plug all empty raceways.
 - b. Enter through floor or wall entrance fittings. For the entrance fittings utilize a gland assembly capable of providing a seal around the conduit to withstand 50 foot head of water without leakage. Use sealing assembly similar to O-Z Gedney Type "FSK" and/or "WSK".
 - c. Slope away from building.
 - d. With a minimum of 24 inches top cover.
27. Provide weather tight outlets for interior and exterior locations exposed to weather or moisture.
28. Provide knockout closures to cap unused knockout holes where blanks have been removed.
29. Install electrical boxes in those locations, which ensure ready accessibility to enclosed electrical wiring.
30. Do not install boxes back-to-back in walls. Provide not less than 6 inches (150 mm) separation.
31. Do not install aluminum products in concrete. Plug and seal conduit interconnections.
32. Position recessed outlet boxes accurately to allow for surface finish thickness.
33. Set floor boxes level and flush with finish flooring material. Coordinate trim with type of finish, i.e. tile, carpet, etc.
34. Fasten electrical boxes firmly and rigidly to substrates or structural surfaces to which attached or solidly embed electrical boxes in concrete or masonry.
35. Subsequent to installation of boxes, protect boxes from construction debris and damage.
36. Set boxes square and true with the building finish. Secure boxes to the building structure and adequately support all boxes during construction to prevent movement.
37. Verify outlet locations in finished spaces with Architectural Drawings of interior details and finishes. Take caution in locating outlet to allow for overhead pipes, ducts, and variations in arrangement, thickness in finish, window trim and other Architectural Construction Details.
38. Correct any inaccuracy in locating outlets without additional expense to the City of New York. Refer to Commissioner any condition that would place an outlet box in an unsuitable location, such as a molding, break glass in wall finish, or behind a heating enclosure.
39. Mount outlet boxes for similar equipment at uniform height within same or similar areas. Where mounting height or location of outlets is not shown or specified, mount outlet as best suited for equipment connected thereto, or as directed.
40. Provide barriers between switches connected to different phases for voltages exceeding 150 volts to ground.

41. Except where special outlets are required, provide 4 inch square wall outlets with single gang raised cover and bushed plate for signaling systems.

B. Rigid Steel Conduit

1. Use rigid steel conduit for underground installation, in wet or damp locations, for exposed runs on the exterior of the building, in concrete slabs, for all feeder conduits, in mechanical equipment spaces, and as noted.
2. Where conduit is directly buried, provide two coats of polyurethane. Dry thoroughly between coats and before backfilling.
3. Where located under the building, encase conduit for all runs above 2 inches with concrete envelope with walls not less than 3 inches thick.

C. Intermediate Metal Conduit

1. Use intermediate metal conduit in lieu of rigid steel conduit where permitted by applicable electrical codes. Do not use intermediate metal conduit in hazardous areas or for direct burial.
2. Where located under the building, encase conduit for all runs above 2 inches with concrete envelope not less than 3 inches thick.

D. Electric Metallic Tubing (EMT)

1. Use electrical metallic tubing for branch circuits only, in dry locations (hung ceilings, hollow block walls and furred spaces) and for smoke detection system where in accordance with all applicable codes, authorities, etc.
2. EMT is not permitted to be used in mechanical equipment spaces and where subject to moisture, dampness, i.e. plenums, condensate spillage, etc.
3. EMT may be used in concrete floor slabs with concrete tight fittings.

E. Flexible Steel Conduit

1. Use flexible steel conduit "Greenfield" with an internal ground connection for short connections where rigid conduit or tubing is impracticable, from outlet box to recessed lighting fixture with minimum length of 4 feet and a maximum length of 6 feet, and for final connections to vibrating equipment, other than motors and transformers, in dry locations only.

F. Liquid Tight Flexible Metal Conduit

1. For damp and wet conditions and in all plenums.
2. Use liquid tight flexible metal conduit for final connections to motor terminal boxes, transformers and other vibrating equipment.
3. Provide a minimum length of 18 inches with slack. Connect the ground conductor to the enclosure or raceway at each end.

G. Provide expansion-deflection fittings at expansion joints and on length of runs in accordance with manufacturer's recommendations. Utilize expansion-deflection fittings of size as required complete with bonding jumper.

H. For Hazardous Locations

1. Utilize rigid steel only, unless otherwise noted.
2. Install UL listed sealing fittings to prevent passage of explosive vapors as required by the applicable electrical codes.

I. For Wet, Damp, or Moist Locations

1. Provide sealing fittings to prevent passage of water vapor, where conduits pass from warm to cold locations, such as refrigerated spaces, air conditioned spaces, or similar spaces.

3.3 FIELD QUALITY CONTROL

- A. Upon completion of installation of raceways, perform continuity tests by testing the resistance of all feeder conduits from the service to the point of their final distribution using 1 conductor return. Limit the maximum resistance to 25 ohms. When possible, field-correct malfunctioning equipment, then retest to demonstrate compliance. Replace equipment which cannot be satisfactorily corrected, at no additional cost to the City of New York.

END OF SECTION 16130

No Text on This Page

SECTION 16140

WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions sections, apply to work of this section.
- B. General Provisions for Electrical Work, Section 16010, applies to work of this Section.
- C. The requirements of this section apply to wiring devices specified elsewhere in these specifications.

1.2 DESCRIPTION OF WORK

- A. Work includes providing all materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the City of New York, all wiring devices in accordance with drawings and specifications.

1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of electrical wiring devices, of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 3 years. Provide wiring devices produced by a manufacturer listed as an Acceptable Manufacturer in this section.
- B. Standards Compliance: Comply with requirements of applicable local codes, NEC, UL, NEMA, and IEEE Standards pertaining to wiring devices. Provide wiring devices which are UL listed and labeled. Provide device plates which are UL listed.
- C. The manufacturer's catalog numbers specified represent the minimum standards required. If products of alternate manufacturers are selected, they must be equal in all respects.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's data on wiring devices.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. For Wiring Devices and Device Plates
 - 1. Lutron
 - 2. Leviton Manufacturing Co.

3. Hubbell Inc.
4. Arrow-Hart Division - Crouse Hinds Co.
5. Bryant Electric Co.
6. Pass and Seymour Inc.

B. For Manual Motor Switches

1. Arrow Hart
2. Hubbell
3. Pass & Seymour

2.2 WALL SWITCHES (FINISHED AREAS)

A. Unless otherwise noted and specified by Interior Designer or Commissioner provide wall switches as specified in this section.

B. Specification grade, heavy duty, rocker, quiet type, back and side wired fully enclosed in composition case.

C. Rating: 120 volt.

D. Switches as follows, unless otherwise indicated:

1. 15 amperes, single pole: Leviton "Decora" No. 5691-2.
2. 20 amperes, single pole: Leviton "Decora" No. 5621-2.
3. 15 amperes, double pole: Leviton "Decora" No. 5602-2.
4. 20 amperes, double pole: Leviton "Decora" No. 5622-2.
5. 15 amperes, three way: Leviton "Decora" No. 5693-2.
6. 20 amperes, three way: Leviton "Decora" No. 5623-2.
7. Key switches of equivalent rating and grade to above switches: Leviton Series 1201-L2 and 1221-L2.
8. Pilot light switches of equivalent rating and grade to above switches: Leviton "Decora" No. 5628-2 and 5638-2.
9. Illuminated switches of equivalent rating and grade to above switches: Leviton "Decora" No. 5631-2 and 5633-2.

E. Color:

1. As specified by Interior Designer.

2.3 RECEPTACLES (FINISHED AREAS)

A. Unless otherwise noted and specified by Interior Designer or Commissioner provide receptacles as specified in this section.

B. Receptacles, specification grade, heavy duty, grounding type, back and side wired, fully enclosed in composition case.

1. 15 amperes, duplex, NEMA 5-15R: Leviton "Decora" No. 16262.
2. 15 amperes, single, NEMA 5-15R: Leviton "Decora" No. 16251.
3. 20 amperes, duplex, NEMA 5-20R: Leviton "Decora" No. 16362.
4. 20 amperes, single, NEMA 5-20R: Leviton "Decora" No. 16351.

5. 15 amperes, single, twist-lock, NEMA L5-15R, Leviton No. 4710.
6. 20 amperes, single, twist lock, NEMA L5-20R: Leviton 2310.
7. 15 amperes, duplex, GFCI: NEMA 5-15R, Leviton "Decora" No. 8598-HG.
8. 20 amperes, duplex, GFCI, NEMA 5-20R, Leviton "Decora" No. 8898-HG.
9. 15 amperes, duplex, isolated ground, NEMA 5-15R: Leviton "Decora" No. 16262-IG.
10. 20 Amperes, duplex, isolated ground, NEMA 5-20R: Leviton "Decora" No. 16362-IG.
11. 30 amperes, 250V, single, NEMA 6-30R: Leviton No. 5372.
12. 15 amperes, 250V, duplex, NEMA 6-15R: Leviton No. 16662-HG.

C. Colors:

1. As specified by Interior Designer.

2.4 WALL SWITCHES (FOR MECHANICAL, BACK-OF-HOUSE AND UNFINISHED AREAS)

A. Specification grade, heavy duty, toggle, quiet type, back and side wired, fully enclosed in composition case.

1. 15 amperes, single pole: Leviton No. 1201-2.
2. 20 amperes, single pole: Leviton No. 1221-2.
3. 15 amperes, three way: Leviton No. 1203-2.
4. 20 amperes, three way: Leviton No. 1223-2.
5. Pilot light switches of equivalent rating and grade to above switches: Leviton series 1201-LH and 1221-LH.
6. Illuminated switches of equivalent rating and grade to above switches: Leviton Series 1201-IL and 1221-PL.

B. Color:

1. As specified by Interior Designer.

2.5 RECEPTACLES (FOR MECHANICAL, BACK-OF-HOUSE AND UNFINISHED AREAS)

A. Specification grade, heavy duty, grounding type back and side wired, fully enclosed in composition case.

1. 15 amperes, duplex, NEMA 5-15R: Leviton No. 5262.
2. 15 amperes, single, NEMA 5-15R: Leviton No. 5261.
3. 20 amperes, duplex, NEMA 5-20R: Leviton No. 5362.
4. 20 amperes, single, NEMA 5-20R: Leviton No. 5361.
5. 15 amperes, duplex GFCI, NEMA 5-15R: Leviton No. 8599.
6. 20 amperes, duplex GFCI, NEMA 5-20R: Leviton No. 8899.
7. 15 amperes, isolated ground, duplex, NEMA 5-15R: Leviton No. 8200-IG.
8. 20 amperes, isolated ground, duplex, NEMA 5-20R: Leviton No. 8300-IG.

2.6 SWITCH, RECEPTACLES, AND SIGNAL OUTLET PLATES

A. Material and Finish for Finished Areas:

1. Durable poly-carbonate thermoplastic, no visible mounting hardware; color as specified by Interior Designer; Finish: Gloss, UV stable color, as selected by Commissioner; specification grade, Leviton Decora Services series. Boxes without devices shall have blank plates.

- B. Material and Finish for Mechanical, Back-of-House, and Unfinished Areas.
 - 1. Smooth metal stainless steel type 302/304: satin finish, struck-up type. Boxes without devices shall be blank plates.
- C. Multiple gang plates, where more than one device is being installed.
- D. Plates for five or more devices engraved as directed by Commissioner.
- E. Plates for weatherproof duplex receptacles:
 - 1. For standard box with duplex receptacle: Leviton No. 4970 for standard box with GFCI duplex receptacle: Leviton No. 4990.
 - 2. For FS box with duplex receptacle: Hubbell 5206WO; for FS box with GFCI duplex receptacle: Hubbell WPFS26; for FS box with single receptacle: Hubbell 7423WO.
- F. Plates for weatherproof switches: Hubbell 1795 or 7423WO, and 1785 for pilot switches.
- G. Jumbo plates not acceptable.

2.7 MANUAL MOTOR SWITCHES

- A. Horsepower rated and voltage rated for motor.
- B. Operating mechanism: snap switch with one pole per phase.
- C. Overload protection: one thermal overload relay with replaceable tripping element for each pole, manually reset from the operating handle; coordinate the heater for each tripping element with the nameplate rating of the motor.
- D. For 2 and 3 pole manual contactors: Arrow-Hart 6808 or 7810.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine conditions under which wiring devices are to be installed. Notify Commissioner in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install wiring devices as indicated, in compliance with manufacturer's written instructions, requirements of applicable standards, and NECA's "Standard of Installation", and in accordance with recognized industry practices to ensure that installation complies with requirements and serves intended function.
- B. Coordinate as necessary to interface installation of wiring devices with other work.
- C. Install wiring devices only in electrical boxes which are clean, free from excess building materials, dirt, and debris.

- D. Install galvanized steel wall plates in unfinished spaces.
- E. Install wiring devices after wiring work is completed.
- F. Install wallplates after painting work is completed.
- G. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL standards 486A and 4860. Use properly scaled torque indicating hand tool.
- H. Protection of wallplates and receptacles: Upon installation of wallplates and receptacles, advise Contractor regarding proper and cautious use of convenience outlets. Prior to City of New York accepting project, replace those items which have been damaged, including those burned and scored by faulty plugs.
- I. Provide equipment grounding connections for wiring devices, unless otherwise indicated. Tighten connections to comply with tightening torques specified in UL standard 486A to assure permanent and effective grounds.
- J. Verify exact locations of switches and receptacles with architectural and interior designer's drawings.
- K. Install switches indicated on plans for the various rooms directly adjacent to the entrance door and/or as shown on plans and details.
- L. Check the architectural drawings for the door swings and locate all switches on the lock side of the openings. Verify in field prior to switch outlet installation.
- M. Coordinate all final mounting heights with Commissioner's elevations and details prior to installation. Where heights are different than those indicated or specified, the architectural heights take precedence.
- N. Where pilot lights are indicated, utilize the neon type integral with the switch actuator, unless specifically noted otherwise.
- O. Fully coordinate switches mounted in metal architectural frames, posts and mullions with all trades involved. Submit method of wiring and type and style switch to Commissioner for approval.
- P. Where more than one wiring device is mounted in the same location, gang mount such devices under a common faceplate.
- Q. Vertically align devices shown above each other on the drawings on a common centerline unless shown otherwise.
- R. Where an outlet is indicated as serving a specific piece of equipment, locate outlet as required by equipment or layout roughing drawings. Work from approved equipment and roughing shop drawings to locate outlets.
- S. Mount receptacles indicated over or above utility or work counters 6 inches above working table. Where splashboards occur, coordinate with splashboards height such as:
 1. 6-inch high splashboard -- mount 9 inches above counter.
 2. 9-inch high splashboard -- mount in splashboard 6 inches above counter.

3.3 FIELD QUALITY CONTROL

- A. Upon completion of installation of wiring devices, prior to energizing circuitry, test wiring devices for electrical continuity and for short-circuits. Ensure proper polarity of connections is maintained. Subsequent to energizing, test wiring devices to demonstrate compliance with requirements.

END OF SECTION 16140

SECTION 16195

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions sections, apply to work of this section.
- B. General Provisions for Electrical Work, Section 16010, applies to work of this Section.
- C. The requirements of this section apply to electrical identification specified elsewhere in these specifications.

1.2 DESCRIPTION OF WORK

- A. Work includes providing all materials, equipment, accessories, and services to complete and make ready for the City of New York, the identification of all electrical equipment as required by this section and other sections of the specifications. This includes, but is not limited to buried cable warning, power, control and communication conductors, operational instruction and warnings; danger signs, and equipment system identification signs.

1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of electrical identification products of types required whose products have been in satisfactory use in similar service for not less than 3 years.
- B. Standards Compliance: Comply with requirements of applicable local codes, NEC, UL, and NEMA standards pertaining to electrical identification.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's data on electrical identification materials and products.
- B. Samples, complete with nomenclature for the following:
 - 1. Engraved lamacoid plates of each size of lettering.
 - 2. Wraparound labels.
 - 3. Metal tags.
 - 4. Enameled sheet metal signage.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. As selected by Contractor.

2.2 LAMACOID NAMEPLATES

- A. Identification for power centers, switchboards and panelboards: Engraved lamacoid nameplates with 1/4 inch high white lettering on black background fastened to the outside face of the front.
- B. Identification for distribution switches or circuit breakers of the following:
 - 1. For Individually Enclosed Units: Engraved lamacoid nameplates with 1/8 inch high white lettering on a black background fastened to outside front face of enclosure.
 - 2. For Switchboards and Panelboards without Doors: Same as for individually enclosed.
 - 3. For Panelboards With Doors: Typewritten directories mounted behind transparent plastic cover, in metal frames fastened on inside face of doors; directories to indicate circuit number, designation of room and number and item being served in directories.

2.3 WRAPAROUND LABELS AND METAL TAGS

- A. Identify the wires and cables of feeders by means of fiber or non-ferrous metal tags fastened with non-ferrous metal wires or bands throughout; fastenings for metal tags of the same metal as the tag.

2.4 ENGRAVED LETTERING

- A. Engrave device plates for local toggle switches, toggle switch-type motor starters, pilot lights, and the like, whose function is not readily apparent with 1/8 inch high letter suitably describing the equipment controlled or indicated.

2.5 STAMPED LETTERING

- A. Stamp phase identification letters into the metal of the bus bars of each phase of the main busses of each power center switchboard and panelboard; make letters visible without having to disassemble any current carrying or supporting elements.

2.6 ENAMELED SHEET METAL SIGNAGE

- A. Equip all electric switchboard rooms, electric closets, metal screened spaces assigned to electric equipment and the like, with enameled sheet metal "red on white" signs reading "Electric Equipment Room - No Storage Permitted"; mount signs at clearly visible locations within the rooms.

2.7 IDENTIFIABLE MARKINGS

- A. Identify each outlet box, junction box and cabinet used in conjunction with empty raceway for wires of a future system by means of identifiable markings on the inside denoting the system.

2.8 ENGRAVE

- A. Device plate for receptacles other than 120 volt 15 and 20 amperes receptacles with 1/8 inch high black letters and designating the following:
 - 1. Voltage
 - 2. Number of phases
 - 3. Current rating
- B. Device plates for receptacles on emergency engraved "EMERGENCY" with 1/4 inch high red letters.
- C. Device plate for boiler B/G station engraved "TO STOP BURNER" with standard white letters on red plate. Similar to ASCO-124301, NEMA-3 enclosure.

2.9 MARK

- A. Cabinets housing emergency lighting and receptacle panelboards with the word "EMERGENCY" stenciled in 2 inch high red letters on the outside of the cabinet, in addition to other lettering and nameplates required above.

2.10 NOMENCLATURE

- A. The nomenclature used to identify power centers, dimmer boards, switchboards and panelboards to match the nomenclature used on the drawings.
- B. The nomenclature used to identify switches or circuit breakers to:
 - 1. Designate where they disconnect mains or service together with suitable differentiating nomenclature where more than one service or main is involved.
 - 2. Designate the feeder number and the name of the load supplied where they control feeders.
 - 3. Designate the name of the space and the load supplied where they control lighting and appliance branch circuitry.
- C. The nomenclature used to identify feeder wires and cables to designate the feeder number.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions under which electrical identification products are to be installed. Notify Commissioner in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install electrical identification products as indicated, in accordance with manufacturer's written instructions, requirements of applicable Standards, and NECA's "Standard of Installation," and in accordance with recognized industry practices to ensure that installation complies with requirements and serves intended function.
- B. Coordinate as necessary to interface installation of electrical identification products with other work.

- C. Comply with governing regulations and requests of governing Commissioner and Utility Company for identification of electrical work.
- D. Wherever reasonably required to ensure safe and efficient operation and maintenance of electrical systems and electrically connected mechanical systems and general systems and equipment, including prevention of misuse of electrical facilities by unauthorized personnel, install signs or similar equivalent identifications, instruction or warnings on switches, outlets and other controls, devices and covers of electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for intended purposes.
- E. Install signs at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate substrate.
- F. Securely fasten signage and nameplates.
- G. Identify each wire or cable in a feeder at its terminal points of connection and in each handhole, pull box, junction box and panel gutter through which it passes.
- H. Label all conductors in wireways and pull and junction boxes with panelboard designations and circuit number.
- I. Identify Individually:
 - 1. Switchboards
 - 2. Main and feeder devices in switchboards
 - 3. Distribution panelboards
 - 4. Main and branch fused switches in distribution panelboards.
 - 5. Circuit breaker panelboards
 - 6. Safety switches
 - 7. Single pole switches used for motor disconnect switch
 - 8. Receptacle plates as indicated in this section
 - 9. Cabinets for life safety systems
 - 10. Cabinets, junction and pull boxes of all systems installed, i.e., telephone, television, security, etc.

END OF SECTION 16195

SECTION 16220
FIRE ALARM SYSTEM

PART 1- GENERAL

1.01. REFERENCES

A. Codes

1. Fire

- a The equipment and installation shall comply with the current provisions of the following codes and standards:
 - i NFPA 70 - 2005 National Electric Code
 - ii NFPA 72 - 1993 National Fire Alarm Code®
 - iii NFPA 90A - 2002 Air Conditioning Systems
 - iv NFPA 101- 2006 Life Safety Code®
 - v UL 864 - Control Units for Fire Protective Signaling Systems.
 - vi UL 268 - Smoke Detectors for Fire Protective Signaling Systems.
 - vii UL 268A - Smoke Detectors for Duct Applications.
 - viii UL 521 - Heat Detectors for Fire Protective Signaling Systems.
 - ix UL 228 - Door Closers-Holders, With or Without Integral Smoke Detectors.
 - x UL 464 - Audible Signaling Appliances.
 - xi UL 38 - Manually Actuated Signaling Boxes for Use with Fire-Protective Signaling Systems
 - xii UL 1971 - Signaling Devices for the Hearing-Impaired.
 - xiii UL 1481 - Power Supplies for Fire Protective Signaling Systems.
 - xiv Factory Mutual (FM) approval
 - xv Federal Codes and Regulations
 - xvi Americans with Disabilities Act (ADA)
 - xvii International Standards Organization (ISO)
 - a. ISO-9000
 - b. ISO-9001

1.02. System Description

A. General

1. The Contractor shall furnish all labor, services and materials necessary to furnish and install a complete, functional NYC Class F fire alarm system. The System shall comply in respects with all pertinent codes, rules, regulations and laws, local jurisdiction, and NYC Building Code. The System shall comply in all respects with the requirements of the specifications, manufacturer's recommendations and Underwriters Laboratories Inc. (ULI) listings.

2. Proprietary Item: 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.

- a. Allowance Amount: Not to Exceed \$19,824.
- 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.

3. Complete information and drawings describing and depicting the entire system(s) as installed, including all information necessary for maintaining, troubleshooting, and/or expanding the system(s) at a future date.

4. Complete documentation of system(s) testing.

5. Certification that the entire system(s) has/have been inspected and tested, is/are installed entirely in accordance with the applicable codes, standards, manufacturer's recommendations and ULI listings, and is/are in proper working order. Contractor shall use "Fire Alarm System Certification and Description" as required by NFPA 72 - 1993 edition as per the NYC Building code modifications.

B. Description 24VDC NACs

1. Provide and install a new fire detection and alarm system that shall consist of:
 - a. Fire Alarm Control Panel located as shown on the drawings.
 - b. Manual pull stations located as shown on the drawings.
 - c. Area smoke detectors located as shown on drawings.
 - d. Area heat detectors located as shown on drawings.
 - e. Duct smoke detectors located as shown on the drawings.
 - f. Provide audible notification appliances located as shown on the drawings.
 - g. Provide synchronized visual notification appliances located as shown on the drawings.
 - h. Provide connection to a central station. The City of New York shall arrange for two dedicated phone lines to be terminated as directed by the installing contractor.

C. Sequence of Operations

1. General 24 VDC NACs

- a The alarm activation of any area smoke detector, heat detector, manual pull station, sprinkler waterflow, the following functions shall automatically occur:
 - i The internal audible device shall sound at the control panel.
 - ii The LCD display shall indicate all applicable information associated with the alarm condition including device type, device location and time/date.
 - a All system activity/events shall be documented in system history and on the system printer.
 - b Any remote or local annunciator LCD/LED's associated with the alarm shall be illuminated.
 - c Activate notification audible appliances throughout the building.
 - d Activate visual strobes notification appliances throughout the building. The visual strobe shall continue to flash until the system has been reset. The visual strobe shall not stop operating when the "Alarm Silence" is pressed.
 - e Transmit an alarm signal to the central station.
 - f All automatic events programmed to the alarm point shall be executed and the associated outputs activated.
 - g All stairwell/exit doors shall unlock throughout the building.

2. Trouble Operation

- a Upon activation of a trouble condition or signal from any device on the system, the following functions shall automatically occur:
 - i The internal audible device shall sound at the control panel.
 - ii The LCD display shall indicate all applicable information associated with the trouble condition including device type, device location and time/date.
 - iii All system activity/events shall be documented on the system printer and system history file.
 - iv Any remote or local annunciator LCD/LED's associated with the trouble zone shall be illuminated.
 - v Transmit a trouble signal to the central station.

3. Monitor Activation

- a Upon activation of any device connected to a monitor circuit, the following functions shall automatically occur:
 - i All system activity/events shall be documented on the system printer.
 - ii The monitor LED will light and pre-programmed functions will activate.

D. System Configuration

1. General

- a All Life Safety System equipment shall be arranged and programmed to provide a system for the early detection of fire, the notification of building occupants, the automatic summoning of the local fire department, the override of the HVAC system operation, and the activation of other auxiliary systems to inhibit the spread of smoke and fire, and to facilitate the safe evacuation of building occupants.

- b The System shall utilize independently addressed smoke detectors, heat detectors and input/output modules as described elsewhere in this specification.

2. Power Supply

- a The power supply shall be a high efficiency switch mode type with line monitoring to automatically switch to batteries for power failure or brown out conditions. The automatic battery charger shall have low battery discharge protection. The power supply shall provide internal power and 24 Vdc at 4.5A continuous for notification appliance circuits.
- b Auxiliary power supplies shall be a high efficiency switch mode type with line monitoring to automatically switch to batteries for power failure or brown out conditions. The automatic battery charger shall have low battery discharge protection. The power supply shall provide internal power and 24 Vdc at 6.4 continuous for notification appliance circuits. The power supply shall be capable of providing 8A to output circuits for a maximum period of 100 ms. All outputs shall be power limited.

3. Display

- a The display module shall be of membrane style construction with a 4 line by 20 character Liquid Crystal Display. The LCD shall use super-twist technology and backlighting for high contrast visual clarity. In the normal mode display the time, the total number of active events and the total number of disable points. In the alarm mode display the total number of events and the type of event on display. Reserve 40 characters of display space for user custom messages. The module shall have visual indicators for the following common control functions; AC Power, alarm, supervisory, monitor, trouble, disable, ground fault, CPU fail, and test. There shall be common control keys and visual indicators for reset, alarm silence, trouble silence, drill and one custom programmable key/indicator. Provide four pairs of display control keys for selection of event display by type (alarm, supervisory, monitor and trouble) and forward / backward scrolling through event listings. The operation of these keys shall be integrated with the related common control indicator that lights when an event of its type is active. Allow the first event of the highest priority to capture the LCD for display so that arriving fire fighters can view the first alarm event "hands free". Provide system function keys: status, reports, enable, disable, activate, restore, program and test. The module shall have a numeric keypad, zero through nine with delete and enter keys.
- b The display module shall be an EST model 2-LCD.

4. Initiating Device Circuits

- a The Initiating device circuits (IDC) used to monitor manual fire alarm stations, smoke detectors and heat detectors shall be Class A (Style "D" or "E").
- b The Initiating device circuits shall be EST Signature series modules.

5. 24 VDC Notification Appliance Circuits

- a 24 VDC Notification appliance circuits (NAC) shall be Class A (Style "Z"). All notification appliance circuits shall have a minimum circuit output rating of 2 amp @ 24 vdc. The notification circuits shall be power limited. Non-power limited circuits are not acceptable.
- b The 24 VDC Notification appliance circuits shall be EST Signature series modules.

6. Audio Notification Appliance Circuits

- a One-way audio notification appliance circuits (NAC) shall be Class A (Style "Z"). All notification appliance circuits shall have a minimum circuit output rating of 35W @70Vrms. The notification circuits shall be power limited. Non-power limited circuits are not acceptable.
- b The one-way audio notification appliance circuits shall be EST Signature series modules.

7. Signaling Line Circuits

- a The signaling line circuit shall communicate from a panel/node to analog/addressable detectors, input modules, output modules, isolation modules and notification appliance circuits.
- b Each signaling circuit connected to addressable/analog devices shall provide a minimum of 20 spare addresses.
- c When a signaling line circuit covers more than one fire/smoke compartments, a wire-to-wire short shall not effect the operation of the circuit from the other fire/smoke compartments.
- d The signaling line circuit (SLC) connecting panels and annunciators shall be Class A (style 7).
- e The signaling line circuit connecting to addressable/analog devices including, detectors, monitor modules, control modules, isolation modules and notification circuit modules shall be Class A (style 6 or 7).

1.03. Submittals

A. Project Submittal

- 1. The contractor shall purchase no equipment for the system specified herein until the City of New York has approved the project submittals in their entirety and has returned them to the contractor. It is the responsibility of the contractor to meet the entire intent and functional performance detailed in these specifications. Approved submittals shall only allow the contractor to proceed with the installation and shall not be construed to mean that the contractor has satisfied the requirements of these specifications. The contractor shall submit three (3) complete sets of documentation within 30 calendar days after award of purchase order.
- 2. Each submittal shall include a cover letter providing a list of each variation that the submittal may have from the requirements of the contract documents. In addition the contractor shall provide specific notation on each shop drawing, sample, catalog cut, data sheet, installation manual, etc. submitted for review and approval of each such variation.
- 3. All drawings and diagrams shall include the Contractor's title block, complete with drawing title, contractor's name, address, date including revisions, and preparer's and reviewer's initials.

4. Product Data

- a Contractor shall provide data sheets with the printed logo or trademark of the

manufacturer for all equipment. Indicated in the documentation shall be the type, size, rating, style and catalog number for all items proposed to meet the system performance detailed in this specification. The proposed equipment shall be subject to the approval of the Architect/Engineer.

5. Shop Drawings
 - a A complete set of shop drawings shall be supplied. The shop drawings shall be reproduced electronically in digital format. This package shall include but not be limited to:
6. Control panel wiring and interconnection schematics.
 - a Complete point to point wiring diagrams.
7. Riser diagrams.
 - a Contractor shall provide complete floor plan drawings locating all system devices and 1/4" = 1'-0" scale plan and elevation of all equipment in the Fire Alarm Control Panel. Elevation drawing shall show the placement of each individual item of fire alarm equipment as well as raceway size and routing, junction boxes, and conductor sizes, quantity, and color in each raceway.
8. Contractor shall provide a detailed system operational description. All Specification differences and deviations shall be clearly noted and marked.
9. Contractor shall furnish a complete system bill of material.
 - a All drawings shall be reviewed and signed off by an individual having a minimum of a NICET certification in fire protection engineering technology, subfield of fire alarm systems.
10. Samples
 - a A sample of each smoke detector, intelligent module, horn and strobe shall be provided to the contractor for their familiarization.
11. Quality Assurance/Control Submittals
 - a Installer's Certification
12. The engineered systems distributor must be licensed in the state of New York and have been incorporated in the business in the state for a minimum of 3 years.
 - a Submit a copy of the contractors training certification issued by the manufacturer of the Life Safety System.
13. Installers shall be licensed with the State of New York.
14. A copy of the installing technician's NICET certification.
15. System Calculations
 - a Complete calculations shall be provided which show the electrical load on the following system components:
 - i Each system power supply, including stand alone booster supplies.
 - ii Each standby power supply (batteries).
 - iii Each notification appliance circuit.
 - iv Each auxiliary control circuit that draws power from any system power supply.

B. Closeout Submittal

1. Two (2) copies of the following documents shall be delivered to the City of New York's

representative at the time of system acceptance. The close out submittals shall include:

2. Project specific operating manuals covering the installed Life Safety System. A generic or typical City of New York's instruction and operation manual shall not be acceptable to fulfill this requirement.
3. As-Built drawings consisting of: a scaled plan of the building showing the placement of each individual item of the Life Safety System equipment as well as raceway size and routing, junction boxes, conductor sizes, quantity, and color in each raceway. All drawings must reflect point to point wiring, device address and programmed characteristics as verified in the presence of the engineer and/or the end user unless device addressing is electronically generated, and automatically graphically documented by the system.
4. All drawings shall be provided in standard .DXF format. A vellum plot of each sheet shall also be provided.
5. The application program listing for the system as installed at the time of acceptance by the City of New York and/or local AHJ (disk, hard copy printout, and all required passwords).
6. Provide the name, address and telephone of the authorized factory representative.
7. A filled out Record of Completion similar to document described in NFPA 72, 1993 edition.

1.04. Quality Assurance

A. Qualification of Contractors

1. The contractor shall have successfully installed similar system fire detection, signaling control components on a previous project of comparable size and complexity. The City of New York reserves the right to reject any control components for which evidence of a successful prior installation performed by the contractor cannot be provided.
2. The contractor shall have in-house engineering and project management capability consistent with the requirements of this project. Qualified and approved representatives of the system manufacturer shall perform the detailed engineering design of central and remote control equipment. Qualified and approved representatives of the system manufacturer shall produce all panel and equipment drawings and submittals and operating manuals. The contractor is responsible for retaining qualified and approved representative(s) of those system manufacturers specified for detailed system design and documentation, coordination of system installation requirements, and final system testing and commissioning in accordance with these specifications.

B. Pre-installation Meetings

1. Pre-Installation Requirements

- a The provider shall submit a detailed project plan that will describe in detail how the provider will approach the project, from inception to finalization. The plan must include at a minimum the following information:

i Project Staging

- ii Project Management
- iii Equipment Schedules
- iv Installation Time Lines
- v Other Trade Requirements
- vi Final Acceptance Testing
- vii Personnel Resumes
- viii Progress Report Sample

b All equipment and components shall be installed in strict compliance with each manufacturer's recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc. before beginning system installation. Refer to the manufacturer's riser/connection diagram and details for all specific system installation/termination/wiring data.

2. Start and Completion Dates

a The starting and completion dates for this work will be established at the pre-bid meeting.

1.05. Project Conditions

A. Conditions

1. It shall be the Contractor's responsibility to inspect the job site and become familiar with the conditions under which the work will be performed. Inspection of the building may be made by appointment with the City of New York. Contractors are requested to inspect the building prior to the pre-bid meeting.

2. A pre-bid meeting will be held to familiarize the Contractors with the project. Failure to attend the pre-bid meeting may be considered cause for rejection of the Contractor's bid. The minutes of this meeting will be distributed to all attendees and shall constitute an addendum to these specifications.

3. All work may be conducted during normal working hours for this project, as defined by the City of New York. Noise restrictions do apply. The core drilling, testing of evacuation signals and other work disruptive to occupants will be prohibited within hours to be determined by the City of New York and will be explained at the pre-bid meeting. Contractor is to include, in his base bid, all overtime necessary to complete his work.

4. The Contractor shall be responsible for prior coordination of all work and demolition with the City of New York.

1.06. Warranty and Maintenance

A. Warranty

1. The contractor shall warranty all materials, installation and workmanship for one (1) year from date of acceptance, unless otherwise specified. A copy of the manufacturer's warranty shall be provided with close-out documentation and included with the operation and installation manuals.

2. The System Supplier shall maintain a service organization with adequate spare parts stock within 75 miles of the installation. Any defects that render the system inoperative shall be repaired within 24 hours of the City of New York notifying the contractor.

B. Spare Parts

1. The Contractor shall supply the following spare parts:

- a Automatic detection devices - Two (2) percent of the installed quantity of each type.
- b Manual fire alarm stations - Two (2) percent of the installed quantity of each type.
- c Glass rods or panels for break glass manual fire alarm stations (if used) - Ten percent of the installed quantity, but no less than two devices.
- d Audible and visible devices - One (1) percent of the installed quantity of each type, but no less than two (2) devices.
- e Keys - A minimum of three (3) sets of keys shall be provided and appropriately identified.

1.07. Training

A. Training

1. The System Supplier shall schedule and present a minimum of 2 hours of documented formalized instruction for the City of New York, detailing the proper operation of the installed System.
2. The instruction shall be presented in an organized and professional manner by a person factory trained in the operation and maintenance of the equipment and who is also thoroughly familiar with the installation.
3. The instruction shall cover the schedule of maintenance required by NFPA 72 and any additional maintenance recommended by the system manufacturer.
4. Instruction shall be made available to the Local Municipal Fire Department.

PART 2 - PRODUCTS

2.01 Panel Components & Functions

A. General

1. The control panel shall be a multi-processor-based system designed specifically for fire and releasing system applications. The control panel shall be listed and approved for the application standard(s) as listed under the General section.
2. The control panel shall include all required hardware, software and system programming to provide a complete and operational system. The control panel shall assure that life safety takes precedence among all panel activities.
3. The control panel shall include the following capacities:
 - a Support up to 380 analog/addressable points.
 - b Support up to 5 fully supervised network remote annunciators.
 - c Support a DACT (dialer) for off premise notification
 - d Support up to 576 chronological events in history.
4. The control panel shall include the following features:
 - a Provide autoprogramming and electronic addressing and mapping of analog/addressable devices.
 - b Provide an operator interface display that shall include functions required for annunciation, command and control system functions.
 - c Provide a discreet system control switch provided for reset, alarm silence, local silence, drill switch, up/down switches, status switch, program switch, enable and disable switches, activate and restore switches, reports switch and test switch.
 - d Provide system reports that provide sensitivity and history details.
 - e Provide an authorized operator with the ability to operate or modify system functions

- like system time, date and passwords as well as autoprogram, enable mapping, restart of the system and clear control panel event history file.
- f Provide an authorized operator to perform test functions within the installed system.
5. Supervision of system components, wiring, initiating devices and software shall be provided by the control panel. Failure or fault of system component or wiring shall be indicated by type and location on the LCD display. Software and processor operation shall be independently monitored for failure.
- B. Annunciation
1. The system shall be designed and equipped to receive, monitor and annunciate signals from devices and circuits installed throughout the building. Manufacturer's standard control switches shall be acceptable if they provide the required operation, including performance, supervision and position indication. If the manufacturers' standard switches do not comply with these requirements, fabrication of custom manual controls acceptable to the City of New York is required.
2. Receipt of alarm, trouble and supervisory signals shall activate integral audible devices at the control panel.
3. The annunciator shall contain the following system status indicators:
- a 80 character Backlit Liquid Crystal Display.
 - b System Power Indicator - green LED.
 - c System Common Alarm - red LED.
 - d System Common Trouble - yellow LED.
 - e System Common Supervisory - yellow LED.
 - f System Common Monitor - yellow LED.
 - g System Ground Fault - yellow LED.
 - h System CPU Fault - yellow LED.
 - i System Disabled - yellow LED.
 - j System Test Point(s) - yellow LED.
 - k System Reset Switch with Integral yellow LED.
 - l System Alarm Silence Switch with Integral yellow LED.
 - m System Local Silence Switch with Integral yellow LED.
 - n System Drill Switch with Integral yellow LED.
 - o System Message Queue Scroll Switches.
 - p Additional buttons as required to provide system control and operator functions.
4. Networked annunciator(s) shall be an EST EST2 series.
- C. Power Supply
1. Each system power supply shall be a minimum of 6 amps @ 24 vdc.
2. Upon failure of normal (AC) power, the affected portion(s) of the system shall automatically switch over to secondary power without losing any alarm, trouble or operator acknowledgment signals.
3. Each system power supply shall be individually annunciated and shall identify the inoperable power supply in the event of a trouble condition.
4. All standby batteries shall be continuously monitored by the system. Low battery and disconnection of battery power supply conditions shall immediately annunciate as a trouble signal, identifying the deficient batteries.

5. All system power supplies shall be capable of recharging their associated batteries, from a fully discharged condition to a capacity sufficient to allow the system to perform consistent with the requirements of this section, in 48 hours maximum.
6. All AC power connections shall be to the building's designated emergency electrical power circuit and shall meet the requirements of Section 1-5.2 of NFPA 72 - 1999. The AC power circuit shall be installed in conduit raceway. The power circuit disconnect means shall be clearly labeled FIRE ALARM CIRCUIT CONTROL and shall have a red marking. The location of the circuit disconnect shall be labeled permanently inside the each control panel.
7. The power supply shall be an EST model 2-PPS/6A.

D. Display

1. System Message Processing and Display Operations:

- a The system shall allow message routing to be configured to any or all annunciators.
- b All system printer port shall be configurable to output any combination of alarm, supervisory, trouble, or monitor, event messages.
- c Each LCD display on each annunciator shall be configurable to display the status of any combination of alarm, supervisory, trouble, or monitor, event messages.
- d Clear distinction shall be provided between alarm, supervisory, trouble, and monitor status messages.
- e The system shall provide the ability to retrieve data from the analog/addressable detectors to a PC while the system is on-line and operational in the protected premises. The uploaded data may then be analyzed in a diagnostic program supplied by the system manufacturer.
- f A standby power supply shall automatically supply electrical energy to the system upon primary power supply failure.

E. Dialer -- DACT

1. The system shall provide an off-premise Digital Alarm Communications Transmitter (DACT) capable of transmitting system alarm, trouble and supervisory events to a central monitoring station (CMS). The DACT shall support dual telephone lines, 20 PPS 4/2 communications, and configured for dual tone multi-frequency (DTMF) or pulse modes. It shall be possible to delay AC power failure reports, auto test call, and site program the DACT using a touch tone phone and password.
2. The DACT shall be an EST model DL2.

2.02 Field-mounted system components

A. Initiating Devices

1. Smoke Detectors & Accessories

- a Analog Addressable Smoke General
 - i Each analog addressable smoke detector's sensitivity shall be capable of being

programmed individually as: most sensitive, more sensitive, normally sensitive, less sensitive or least sensitive.

- ii An alternate alarm sensitivity level shall be provided for each detector, which can be set to any of the five (5) sensitivity settings manually or automatically using a time of day event.
 - iii The detector's sensing element reference point shall automatically adjust, compensating for background environmental conditions such as dust, temperature and pressure. Periodically, the sensing element real-time analog value shall be compared against its reference value. The detector shall provide a maintenance alert signal indicating that 80% to 99% compensation has been used. The detector shall provide a dirty fault signal indicating that 100% compensation has been used.
 - iv The system shall allow for changing of detector types for service replacement purposes without the need to reprogram the system. The replacement detector type shall automatically continue to operate with the same programmed sensitivity levels and functions as the detector that it replaced. System shall display an off-normal condition until the proper detector type has been installed or a change in the application program profile has been made.
- b Smoke Detector – Photoelectric
- i Provide analog/addressable photoelectric smoke detectors at the locations shown on the drawings. The system shall have the ability to set the sensitivity and alarm verification of each of the individual detectors on the circuit. It shall be possible to automatically change the sensitivity of individual analog/addressable detectors for the day and night periods. Each smoke detector shall be capable of transmitting alarm signals as well as normal, trouble and need cleaning information. It shall be possible to program control panel activity to each level. Each smoke detector may be individually programmed to operate at any one of five (5) sensitivity settings. Each detector's microprocessor shall contain an environmental compensation algorithm that identifies and sets ambient environmental thresholds approximately six times every hour. The microprocessor shall monitor the environmental compensation value and alert the system operator when the detector approaches 80% and 100% of the allowable environmental compensation value.
 - ii The analog/addressable photoelectric smoke detector shall be an EST model SIGA-PS.
- c Duct Detector Housing
- i Provide smoke detector duct housing assemblies to mount an analog/addressable detector along with a standard, relay or isolator detector mounting base. The housing shall also protect the measuring chamber from damage and insects. The housing shall utilize an air exhaust tube and an air sampling inlet tube that extends into the duct air stream up to ten feet. Drilling templates and gaskets to facilitate locating and mounting the housing shall also be provided. The housing shall be finished in baked red enamel. Remote alarm LED indicators and remote test stations shall be provided.
 - ii The smoke detector duct housing shall be an EST model SIGA-DH.
- d Heat Detectors
- i Fixed Temperature Heat Detector

- a. Provide analog/addressable fixed temperature heat detectors at the locations shown on the drawings. The heat detector shall have a nominal fixed temperature alarm point rating of 135°F (57°C). The heat detector shall be rated for ceiling installation at a minimum of 70 ft (21.3m) centers and be suitable for wall mount applications.
 - b. The analog/addressable fixed temperature heat detector shall be EST model SIGA-HFS.
- e Detector Bases
- i Detector Base - Standard
 - a. Provide standard detector mounting bases suitable for mounting on either North American 1-gang, 3½ or 4 inch octagon box and 4 inch square box, or European BESA or 1-gang box. The base shall, contain no electronics and support all series detector types.
 - b. The standard detector base shall be an EST model SIGA-SB.
- f Manual Stations
- i Manual Station - Single Action Single Stage
 - a. Provide analog/addressable single action, single stage fire alarm stations at the locations shown on the drawings. The fire alarm station shall be of metal construction and incorporate an internal toggle switch. The station shall be finished in red with silver "PULL IN CASE OF FIRE" lettering. The manual station shall be suitable for mounting on North American 2 ½ (64mm) deep 1-gang boxes and 1 ½ (38mm) deep 4 square boxes with 1-gang covers.
 - b. The analog/addressable single action, single stage fire alarm stations shall be EST model SIGA-270.

B. Notification Appliances

1. General

- a General (signals)
 - i All appliances which are supplied for the requirements of this specification shall be UL Listed for Fire Protective Service, and shall be capable of providing the "equivalent facilitation" which is allowed under the Americans with Disabilities Act Accessibilities Guidelines (ADA(AG)), and shall be UL 1971 Listed.
 - ii All appliances shall be of the same manufacturer as the fire alarm control panel specified to ensure absolute compatibility between the appliances and the control panel, and to ensure that the applications of the appliances are done in accordance with the single manufacturer's instructions.
 - iii Appliances that do not meet the above requirements, and are submitted for use must show written proof of their compatibility for the purpose intended. Such proof shall be in the form of documentation from all manufacturers that clearly states that their equipment (as submitted) is 100% compatible with each other for the purpose

intended. All strobes shall be provided with lens markings oriented for wall mounting.

b Horn-Strobes

i Low Profile Horn-Strobes

a. Provide low profile wall mount horn/strobes at the locations shown on the drawings. The horn/strobe shall provide an audible output of 84 dBA at 10 ft. when measured in reverberation room per UL-464. Strobes shall provide synchronized flash outputs. The strobe output shall be determined as required by its specific location and application from a family of 15cd, 30cd, 60cd, 75cd & 110cd devices. The horn shall have a selectable steady or synchronized temporal output. In and out screw terminals shall be provided for wiring. Low profile horn/strobes shall mount in a North American 1-gang box.

b. The low profile wall mount horn/strobes shall be EST.

c Strobes

i Low Profile Strobes

a. Provide low profile wall mounted strobes at the locations shown on the drawings. In and out screw terminals shall be provided for wiring. Strobes shall provide synchronized flash outputs. Strobe output shall be determined as required by its specific location and application from a family of 15cd, 30cd, 60cd, 75cd, or 110cd devices. Low profile strobes shall mount in a North American 1-gang box.

b. The low profile wall mounted strobes shall be EST.

C. Initiation & Control Modules

1. Relay Module

a. Provide addressable control relay circuit modules at the locations shown on the drawings. The module shall provide one (1) form C dry relay contacts rated at 24Vdc @ 2 amps (pilot duty) to control external appliances or equipment. The position of the relay contact shall be confirmed by the system firmware.

b. The addressable control relay circuit module shall be an EST model SIGA-CR.

2. Notification Appliance Circuits

a. Provide addressable notification appliance circuit modules at the locations shown on the drawings. The module shall provide one (1) supervised Class B notification circuit. The module shall provide polarized audible / visual selection for 24Vdc @ 2amps, audio outputs at 25Vrms @ 50 watts or 70 Vrms @ 35 watts.

b. The addressable notification appliance circuit module shall be EST model SIGA-CCI series.

PART 3 - EXECUTION

3.01 Installation

A. General

1. All equipment shall be attached to walls and ceiling/floor assemblies and shall be mounted firmly in place. Detectors shall not be supported solely by suspended ceilings. Fasteners and supports shall be sized to support the required load.

B. Installation Sequence

1. Installation of the systems shall be conducted in stages and phased such that circuits and equipment are installed in the following order:
 - a Riser conduits, AC power conduits and control cabinets.
 - b Fire Alarm Control Panel, control component(s), annunciator(s), remote CRT terminal(s), and printer(s).
 - c Conduits and wiring for complete notification circuits and appliance installation throughout facility.
 - d Pre-test the audible and visual notification appliance circuits.
 - e Install all new detection devices.
 - f Terminations between field devices and the associated control equipment.
 - g The detection system shall be switched over and end of each day the system shall be operational. At no time will the system be placed out of service over night.
 - h Complete contractor pre-test of system.
 - i Complete system testing.

C. Conductors

1. The requirement of this section apply to all system conductors, including all signaling line, initiating device, notification appliance, auxiliary function, remote signaling, AC and DC power and grounding/shield drain circuits, and any other wiring installed by the Contractor pursuant to the requirements of these Specifications.
2. All circuits shall be rated power limited in accordance with NEC Article 760.
3. All new system conductors shall be of the type(s) specified herein.
4. All initiating circuit, signaling line circuit, AC power conductors, shield drain conductors and grounding conductors, shall be solid copper, stranded or bunch tinned (bonded) stranded copper.
5. All signaling line circuits, including all addressable initiating device circuits shall be 18 AWG minimum or as per manufacturer's requirements.
6. All non-addressable initiating device circuits, 24 VDC auxiliary function circuits shall be 14 AWG minimum or per manufacturer's requirements.
7. All notification appliance circuit conductors shall be solid copper or bunch tinned (bonded) stranded copper. Where stranded conductors are utilized, a maximum of 7 strands shall be permitted for No. 16 and No. 18 conductors, and a maximum of 19 strands shall be permitted for No. 14 and larger conductors.
8. All audible notification appliance circuits shall be 14 AWG minimum twisted pairs or twisted pairs shielded or per manufacturer's requirements.
9. All visual notification appliance circuits shall be 14 AWG minimum THHN or twisted pairs or twisted shielded pairs or per manufacturer's requirements.

D. Conductors and Raceway

1. Except as otherwise required by the NYC Building Code and/or these Specifications, the installation of all system circuits shall conform to the requirements of Article 760 and raceway installation and to the applicable sections of Chapter 3 of NFPA 70 - 2005, National Electrical Code. Fire alarm circuit wiring shall include all circuits described in Section 760-1, and as defined by the manufacturer's UL listing.
2. The entire system shall be installed in a skillful manner in accordance with approved manufacturer's installation manuals, shop drawings and wiring diagrams. The contractor shall furnish all conduit, wiring, outlet boxes, junction boxes, cabinets and similar devices necessary for the complete installation. All wiring shall be of the type required by the NEC and approved by local authorities having jurisdiction for the purpose.
3. Any shorts, opens, or grounds found on new or existing wiring shall be corrected prior to the connection of these wires to any panel component or field device.
4. The contractor shall neatly tie-wrap all field-wiring conductors in the gutter spaces of the control panels and secure the wiring away from all circuit boards and control equipment components. All field-wiring circuits shall be neatly and legibly labeled in the control panel. No wiring except home runs from life safety system circuits and system power supply circuits shall be permitted in the control panel enclosures. No wiring splices shall be permitted in a control panel enclosure.
5. All penetration of floor slabs and firewalls shall be fire stopped in accordance with all local fire codes.

E. Open Cable

1. Power-limited cable in accordance with NEC 70, where used, not installed in UL listed metal conduit or raceway shall be mechanically protected by building construction features:
2. Installation shall be in areas not subjected to mechanical injury.
3. All circuits shall be supported by the building structure. Cable shall be attached by straps to the building structure at intervals not greater than 10 feet. Wiring installed above drop ceilings, cable shall not be laid on ceiling tiles. Cable shall not be fastened in a manner that puts tension on the cable.
4. Cable type shall be FPLP, FPLR or FPL, or permitted substitutions, selected for the installation application as required by NEC 70, Section 760-61.
5. All cable that is not enclosed by conduit shall be supported and anchored with nylon straps or clamps. The use of staples is prohibited.

F. Conduit Raceway

1. All systems and system components listed to UL864 Control Units for Fire Protective Signaling Systems maybe installed within a common conduit raceway system, in accordance with the manufacture's recommendations. System(s) or system components not listed to the UL864 standard shall utilize a separate conduit raceway system for each of the sub-systems.
2. The requirements of this section apply to all system conduits, raceways, electrical enclosures, junction boxes, pull boxes and device back boxes.

3. All system conduits shall be of the sizes and types specified.
4. All system conduits shall be EMT, 3/4 -inch minimum, except for flexible metallic conduit used for whips to devices only, maximum length 6 feet, 3/4-inch diameter, minimum.
5. All system conduits, which are installed in areas, which may be subject to physical damage or weather, shall be IMC or rigid steel, 3/4 -inch minimum.
6. Conduits shall be sized according to the conductors contained therein. Cross sectional area percentage fill for system conduits shall not exceed 40%.
7. Provide all new conduit raceway and conduit riser.
8. All fire alarm conduit systems shall be routed and installed to minimize the potential for physical, mechanical or by fire damage, and so as not to interfere with existing building systems, facilities or equipment, and to facilitate service and minimize maintenance.
9. All conduits, except flexible conduit whips to devices, shall be solidly attached to building structural members, ceiling slabs or permanent walls. Conduits shall not be attached to existing conduit, duct work, cable trays, other ceiling equipment, drop ceiling hangers/grids or partition walls, except where necessary to connect to initiating, notification, or auxiliary function devices.
10. All system conduits, junction boxes, pull boxes, terminal cabinets, electrical enclosures and device back boxes shall be readily accessible for inspection, testing, service and maintenance.

3.02 Field Quality Control

A. Test & Inspection

1. All intelligent analog addressable devices shall be tested for current address, sensitivity, and user defined message.
2. All wiring shall be tested for continuity, shorts, and grounds before the system is activated.
3. All test equipment, instruments, tools and labor required to conduct the tests shall be made available by the installing contractor.
4. The system including all its sequence of operations shall be demonstrated to the City of New York, his representative, and the local fire inspector. In the event the system does not operate properly, the test shall be terminated. Corrections shall be made and the testing procedure shall be repeated until it is acceptable to the City of New York, his representatives and the fire inspector.
5. At the final test and inspection, a factory trained representative of the system manufacturer shall demonstrate that the system functions properly in accordance with these specifications. The representative shall provide technical supervision, and participate during all of the testing for the system.
6. All fire alarm testing shall be in accordance with National Fire Alarm Code, NFPA 72 - 1993.

7. The Contractor shall submit a letter, certifying that the system is installed entirely in accordance with the system manufacturer's recommendations and within the limitations of the required listings and approvals, that all system hardware and software has been visually inspected and functionally tested by a manufacturer's certified representative and that the system is in proper working order.

END OF
SECTION

SECTION 16442

PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions sections, apply to work of this section.
- B. General Provisions for Electrical Work, Section 16010, applies to work of this section.

1.2 DESCRIPTION OF WORK

- A. Work includes providing all materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the City of New York, all panelboards in accordance with Drawings and Specifications.

1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in the manufacture of panelboards of the types and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years. Provide panelboards produced by a manufacturer listed as an Acceptable Manufacturer in this section.
- B. Standards Compliance: Comply with requirements of applicable local codes, NEC, UL, and NEMA Standards pertaining to panelboards. Provide panelboards which are UL listed and labeled. Where panelboards are utilized as service entrance equipment, provide panelboards UL listed and labeled as service entrance equipment. Where panelboards are utilized outdoors, provide panelboards, UL listed and labeled for outdoor use.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's data for panelboards including size, enclosures, and electrical ratings and characteristics.
- B. Shop Drawings: Submit dimensional layouts on architectural background drawings.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERES

- A. For Panelboards
 - 1. Metropolitan Electric.
 - 2. General Electric Company
 - 3. Square D Company

4. Westinghouse Electric Corp.
5. Siemens/ITE.
6. Lincoln Electric.
7. Galaxy Switchboard

2.2 PANELBOARDS

A. Construction

1. Dead-front type complete with cabinet, and additional features as specified or shown on drawings.
2. Rating: 120/208 volt, 3 phase, 3 wire or, 3 Phase, 4 Wire as scheduled in specifications.
3. Factory assembled interior complete with overcurrent protective devices as indicated; interior designed and assembled so that any individual overcurrent protective device can be replaced without disturbing adjacent units or removing main bus; include required bussing for the installation of future circuit breakers scheduled as spaces on drawings; bus bar taps for panels with single pole branches arranged for sequence phasing of the branch circuit devices.
4. Full size neutral bus and copper ground lug bar unless otherwise noted, with a suitable lug for each outgoing circuit requiring a neutral connection and ground connection.
5. Multi-section panels where required to comply with New York City Electrical Code, whether or not indicated on the drawings.
6. In multi-section panels install a power distribution block and/or sub-feed lugs in the enclosure of one of the sections to permit the termination of the incoming feeder conductors as well as the extension of jumpers to the lugs of each main circuit breaker; wire size of jumpers to match that of the incoming feeder size. In the case of multi-conductor feeders, reduce the size of jumpers in compliance with the New York City Electrical Code tap rules.

B. Main Bus Bars

1. Material: Copper for distribution panelboards; copper for lighting and receptacle panelboards.

C. Cabinets

1. Flush or surface mounted as indicated in schedules.
2. Back box of sufficient size for minimum gutter space in accordance with National Electrical Code; size box for additional wiring space where feeder cables supplying the main of a panel are carried through the box to supply other electrical equipment. Panel construction shall be "Door within a Door" type to facilitate viewing of panel gutters.
3. Rigidity and gauge of steel as per UL standards.
4. Trim fabricated of code gauge steel hot-dip galvanized with hinged door lock and catch and directory pocket covered with clear plastic shield over directory; metal chemically cleaned, prime-painted, and finish-coat with the manufacturer's standard paint for the application; all locks common keyed two keys per lock.
5. Typewritten circuit directory not less than 5 by 8 inches with metal retainer and glass or substantial plastic cover, inside each cabinet door; stick-on directories not acceptable; ink pencil or handwritten directories are not acceptable; directory to include panel number or designation, panel feeder size, and for each circuit description of load, fuse or breaker rating, wire size and cabinet size.

2.3 LIGHTING AND RECEPTACLE PANELS

A. Circuit breaker type.

B. Plug-in panelboards and load center construction not acceptable.

C. Circuit Breakers

1. Bolt-on thermal magnetic type unless otherwise indicated, with the following features:
 - a. Magnetic blow-out or other approved arc-quenching devices.
 - b. For 2- and 3-pole breakers, non-conductive barriers between poles with separate tripping element in each leg, and with common trip operation.
 - c. Single-operating handle to open all poles with all handles clearly marked for "On" and "Off" position. Two- and 3-pole breakers with handle ties are not acceptable.
2. Combination circuit breakers and ground fault interrupter, where indicated.
3. Circuit breakers approved for switching duty and marked SWD, where used as switches for 120-volt fluorescent lighting circuits.
4. Interrupting Rating: 22,000 RMS symmetrical amperes minimum interrupting rating at 120/208 volt; higher interrupting ratings as scheduled, and higher rated frames to meet duty indicated.
5. Minimum integrated equipment short circuit rating: Equal to or greater than the available fault rating as (indicated on drawings) (scheduled); mark panelboards with the maximum short circuit current rating at the supply voltage and UL listed; UL recognized series ratings or current limiting breakers are not permitted to meet this requirement.
6. Tandem circuit breakers are not permitted.
7. Circuit breaker handle lock-off devices for all exit lighting circuits and where indicated.
8. Circuit breakers for mechanical equipment shall be "HACR" rated.

2.4 DISTRIBUTION PANELS

A. Fusible switch distribution panels:

1. Quick-make, quick-break fusible switches.
2. Switches rated 30 to 600 amperes with fuse clips rated for Class R rejection type fuses with a 200,000 AIC rating.
3. Switches rated 800 through 1200 amperes with Class L fuse mountings with a 200,000 AIC rating.
4. Safety cover interlocks to prevent opening of the cover with a switch in the "On" position or prevent placing the switch in the "On" position with a cover open; provide defeater for authorized personnel.
5. Handles with provision for padlocking clearly indicating the "On" or "Off" position; front door covers padlockable in the closed position.

B. Circuit Breaker Distribution panels:

1. Bolt-on thermal magnetic type unless otherwise indicated, with the following features:
 - a. Magnetic blow-out or other approved arc-quenching devices.
 - b. For 2- and 3-pole breakers, non-conductive barriers between poles with separate tripping element in each leg, and with common trip operation.
 - c. Single-operating handle to open all poles with all handles clearly marked for "On" and "Off" position; 2- and 3-pole breakers with handle ties are not acceptable.
2. Molded case circuit breakers tested and UL labeled per UL 489.
3. Breakers 100 through 400 ampere frame size:

- a. For interrupting ratings of not over 25,000 AIC maximum: Thermal magnetic trip with inverse time current characteristics.
 - b. For interrupting ratings above 25,000 AIC and not over 100,000 AIC maximum: Current limiting circuit breakers.
4. Breakers above 400-ampere frame:
- a. For interrupting ratings not over 50,000 AIC maximum: Solid-state trip and rating plugs with trip ratings as indicated on drawings; rating plugs interlocked so they cannot be interchangeable between frames and interlocked such that the breaker cannot be latched with rating plug removed; breakers with built-in test points for testing all breakers 600 amperes and above; trip unit with adjustable short time delay and adjustable instantaneous pickups.
 - b. For interrupting ratings above 50,000 AIC and not over 200,000 AIC: Breakers with replaceable current limiters incorporating coordinated time delay thermal magnetic trip protection and current limiting protection in one assembly; current limiters not to be affected when the thermal and/or magnetic trip functions clear the circuit.
- 5. Adjustable instantaneous trip for motor feeder protective devices about 100 amperes.
 - 6. Minimum interrupting rating as indicated on drawings.

2.5 SEPARATE SWITCHES AND CIRCUIT BREAKERS

- A. Mount in separate cabinets with gutter space and with latched outer door.
- B. Mounting and NEMA size in accordance with application or as indicated on drawings.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions under which panelboards and enclosures are to be installed, and notify Architect in writing of conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install panelboards and enclosures as indicated, in accordance with manufacturer's written instructions, requirements of applicable Standards, and NECA's "Standards of Installation," and in accordance with recognized industry practices to ensure that installation complies with requirements and serves intended function.
- B. Coordinate as necessary to interface installation of panelboards with other work.
- C. Tighten connectors and terminals, including screws and bolts and equipment grounding connections, 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 Standards 486A and B.
- D. Fasten enclosures firmly to walls and structural surfaces, ensuring that they are permanently and mechanically anchored. Provide all angle units and accessories for proper mounting.

- E. Provide properly wired electrical connections for panelboards within enclosures.
- F. Double lugging is not permitted.
- G. Fill out panelboards circuit directory card upon completion of installation work.
- H. Insert fuses, if any, of ratings indicated, within installed panelboards.
- I. For all recessed panelboards provide two 1-inch conduits stubbed up and capped 6 inches above ceiling.
- J. Provide equipment grounding connections sufficiently tight to assure a permanent and effective ground for panelboards.

3.3 FIELD QUALITY CONTROL

- A. Upon completion of installation of panelboards and after circuiting has been energized, demonstrate capability and compliance of panelboards with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and retest.
- B. Prior to energizing of electrical circuitry, check all accessible connections to manufacturer's tightening torque specifications.
- C. Prior to energizing of panelboards, check with ground resistance tester phase-to-phase and phase-to-ground insulation resistance levels to ensure requirements are fulfilled.
- D. Prior to energizing, check panelboards for electrical continuity of circuits, and for short circuits.
- E. Adjust operating mechanisms for free mechanical movement.
- F. After energizing, check phase balancing and adjust accordingly.
- G. Touch-up scratched or marred surfaces to match original finishes.

END OF SECTION 16442

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SECTION 16750

TELECOMMUNICATIONS CABLING SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work of this Section shall comply with Contract Documents, including General Conditions, and Supplemental General Requirements.
- B. The general conditions for contracts of construction, referred to in the contract documents as the general conditions, together with the following articles of the telecommunications cabling specifications, which amend, modify and supplement various articles and provisions of the general conditions, are made part of the Contract and shall apply to all work under the Contract.
- C. All articles or parts of articles of the general conditions not so amended, modified or supplemented by these telecommunications cabling specifications shall remain in full force and effect. Should any discrepancy become apparent between the general conditions and these telecommunications cabling specifications the Contractor shall notify The City of New York/Engineer, in writing, and the City of New York/Commissioner shall interpret and decide such matters in accordance with the provisions of the General Conditions.
- D. The Contractor shall comply with all applicable governmental regulations and with all Federal, State, County, City, and other applicable codes and ordinances.
- E. These specifications call out certain duties of the Contractor and his suppliers. They are not intended as a material list of items required by the Contract.
- F. These divisions of the specifications cover the telecommunication cabling system for the Brooklyn Public Library Rugby Branch located at 1000 Utica Avenue, Brooklyn, NY.
- G. It is the intent of these specifications to provide a complete workable telecommunications cabling system ready for the City of New York's use. Any item not specifically shown on the drawings or called for in the specifications, but normally required to conform with the intent, are to be considered as part of the Contract.
- H. Any given item of equipment or material shall be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item shall not be permitted, unless specifically noted otherwise.
- I. These specifications are equipment and performance specifications. Actual installation shall be as indicated on the Drawings. Any discrepancies found between these Specifications and the Drawings shall be immediately brought to the attention of the City of New York. Installation and details indicated on the Drawings shall govern if they differ from the Specifications.
- J. Certain terms such as "shall, provide, install, complete, start up" are not used in some parts of these specifications. This does not indicate that the items shall be less than completely installed or that systems shall be less than complete.

1.02 DEFINITION OF TERMS

- A. *Equipment* refers to any and all items, off-the-shelf or custom, used to assemble the system.
- B. *System* refers to, singularly and/or collectively, the complete, interconnected assemblage of equipment as specified and intended herein.
- C. *Wiring or Cabling* means the inclusion of all fittings, conductors, connectors, connections, terminations and termination hardware and all other items necessary and/or required in connection with such work.
- D. *Conduit, Cable Tray or Ladder Rack* means the inclusion of all fittings, hangers, supports, sleeves, etc.
- E. *Concealed* means embedded in masonry or other construction, installed behind wall furring or within double partitions, or installed within hung ceilings or under raised floor.
- F. *Exposed* means not installed underground or "CONCEALED" as defined above.
- G. *Category 6* means cabling and components which comply with all the applicable mechanical and electrical specifications for Category 6 cabling and connecting hardware as defined in EIA/TIA-568-B series "*Commercial Building Telecommunications Cabling Standard*", EIA/TIA-568-B.2-1 "*Commercial Building Telecommunications Cabling Standard - Part 2: Balanced Twisted Pair Components - Addendum 1 - Transmission Performance Specifications for 4-Pair 100 Ohm Category 6 Cabling*".
- H. *Link* means end-to-end cabling from the patch panel in the equipment room to the faceplate at the workstation including all cabling, cross connects, patches, connectors, termination hardware and patch cables.
- I. *Channel* means end to end cabling from the desk top equipment to the equipment port in the equipment room, including all cabling, cross connects, patches, connectors, termination hardware and patch cables.
- J. *High Pair Count Cable* means UTP cabling which contains more than 25 individual pairs under a common outer jacket.
- K. Refer to *Abbreviations* definitions on Drawings.

1.03 WORK SUMMARY

- A. General: The scope of work comprises the supply, installation, testing, commissioning, maintenance and defects liability service of materials, labor and equipment for the complete telecommunications cabling system installation.
- B. Work Included: The work includes, but is not necessarily limited to, the following:
 - 1. 4-pair Category 6 Unshielded Twisted Pair (UTP) telecommunications cabling between individual outlet locations and the IT Room (ITR).
 - 2. High pair count UTP tie cabling within the ITR, between wall mounted termination blocks and rack mounted patch panels.
 - 3. Wall mounted category 3 UTP termination blocks including all necessary connecting blocks and wire management hardware within the 27th floor ITS.
 - 4. Rack mounted Category 6 UTP patch panels, including all necessary installation kits, inserts, etc. in the ITR.

5. Equipment racks, as noted on the drawings, in the ITR.
 6. Termination and connectorization of all cables provided under this contract.
 7. Patch Cords and punch down cross connects as noted herein.
 8. Spiral wrapping of all exposed UTP cables.
 9. Ceiling mounted "J" hook supports as noted herein.
 10. Labeling and documentation, as indicated herein, of all cables, face plates, frames, racks and panels installed under this contract.
 11. Testing, as noted herein, of all UTP, and coaxial cables provided under this work.
 12. Preparation and submission of shop drawings, testing reports, as built drawings, and cable documentation as described below.
 13. Fire-stopping of all rated floor and wall penetrations.
- C. Related Work: The following related items are specified in others sections of the specifications;
1. Ladder Rack and Vertical Cable Tray (Provided under Section 16751).
 2. Telecommunications signal grounding system (Provided under Electrical).
 3. Wall mounted back boxes, receptacle boxes and floor boxes, including conduit stub-ups (Provided under Electrical).
 4. Floor box outlets for the telecommunications systems (Provided under Electrical).
 5. All conduits, conduit sleeves and pull boxes for the telecommunication systems (Provided under Electrical).
 6. Plywood backboards (Provided under architectural work).
 7. Provision of penetrations through beams, walls, floors, ceilings, roofs and cupboards for installation of cables and cable ladders/trays (Provided under architectural work).
 8. Provision of access panels in trimmed openings in ceilings and walls where required (Provided under architectural work).
 9. Provision of all patching, plastering, filling and making good of all penetrations, chases and openings for electrical services pertaining to the telecommunication system (Provided under architectural work).

1.04 SITE VISIT

- A. Prior to bid submission, the Contractor shall examine the drawings of other trades to determine the existing design conditions that may affect the work. The Contractor shall be held responsible for any assumptions in regard thereto.
- B. The Contractor shall verify all dimensions and distances in the field and document the cable lengths and materials to be furnished and installed. The provision and installation of non specified miscellaneous hardware, i.e., nuts, bolts, tie wraps, etc., shall also be the Contractor's responsibility.
- C. Contractor should note this is an existing facility under renovation. Existing site conditions, other contract documents and the overall construction schedule must be carefully reviewed to determine all required interfacing and timing of the work.

- D. Existing Contract Documents for all other trades shall be made available for review through the General Contractor.

1.05 CONTRACTOR QUALIFICATIONS

- A. Contractor shall have a minimum of 3 years experience in the installation of telecommunications cabling systems of the type and size to be provided on this project.

1.06 QUALITY ASSURANCE

- A. All materials furnished shall be new and unused and free from defects. All materials shall meet all applicable codes provided a standard has been established for the material in question.
- B. All products and materials to be clean, free of manufacturers defects, and free of damage and corrosion.

1.07 SUBMITTALS

- A. Submit within five working (5) days of notice to proceed the following items in accordance with the Contract Documents:

- I. Product Data

- a. Three (3) sets of original manufacturer's product data sheets for all material and equipment proposed for use on this project. Only specified or accepted manufacturers or suppliers shall appear in the product data submittal.
 - b. Where product data sheets contain information on multiple products or product configurations, the specific item being submitted for approval shall be clearly marked.

- II. Shop Drawings

- a. Two (2) reproducible vellum plot sets and three (3) blue line copies of each drawing (bound) showing:
 - 1) Point-to-point intra-building cabling diagrams for all cables installed under this Contract, including: floor plans and risers showing all outlet locations, vertical and horizontal backbone cable routing, overhead and underfloor horizontal cable routing and cable tie-down points, cable support placement, horizontal/backbone cable termination locations, etc. Include wire run sheets, cable termination schedule, and any other field wiring details.
 - 2) Detailed plan views and elevations of the ITR showing: exact placement of termination blocks and/or patch panels in racks and cabinets, ladder rack placement in relationship to lighting fixtures, duct work and diffusers, sprinkler piping, etc., cable routes between termination points, cable routes between riser and termination points, etc.
 - 3) Mounting and support details for all outlets provided under this work.
 - 4) Single line diagrams showing types, quantities, routing, termination points and termination hardware types for all inter-cabinet and inter-rack cabling.
 - 5) Drawings must show evidence of coordination with other trades.

3. Individual submissions shall be provided for each specific material, system or equipment as identified herein. Submittals provided other than in this manner shall be returned without review.
4. All product data and drawings shall be submitted sufficiently in advance of field requirements to allow ample time for review and re-submittal as may be required. All submittals shall be complete and contain all required and detailed information.
5. Acceptance of any submittal data or shop drawing shall not relieve the contractor from responsibility for errors, omissions or inadequacies of any sort.
6. Each product data submittal shall contain the contractors name, project number, project title and specific reference to the applicable drawing and specification section.

B. As-Built Documents

1. During construction, the contractor shall keep an accurate record of all deviations between the work as shown on the drawings and that which is accurately installed.
2. Upon completion of work and acceptance by the City of New York/Commissioner, provide As-Built drawings of the complete system including, but not limited to, the following:
 - a. Scaled floor plans of each floor showing the exact location of each wall mounted outlet, access floor box as well as the route and of each conduit and overhead cable tray.
 - b. Scaled installation details showing each typical installation configuration.
 - c. As-built drawings shall be provided in both reproducible hard-copy (Vellum) and machine readable (AutoCAD V.2004) format.
 - d. Provide the City of New York/Commissioner with two (2) sets of Operation and Maintenance Manuals including:
 - e. Reduced-size (minimum 11" x 17") prints of all as-built drawings as described above.
 - f. Copies of all shop drawings.
 - g. Manufacturers original cut sheets for each component provided under this work.
 - h. Manuals shall be provided in a high quality, 3-ring binder and completely indexed. Submit manuals to the City of New York not more than 2 weeks after project completion.
3. Provide the City of New York with two (2) sets of Operation and Maintenance Manuals including installation diagrams, parts lists, shop drawings and manufacturers' information on all equipment and cables provided by the contractor. Manuals shall be provided in a high quality, 3-ring binder and completely indexed. Submit manuals to the City of New York not more than 1 week after project completion.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials: Deliver materials (except bulk materials) in manufacturer's unopened container, fully identified with manufacturer's name, trade name, type, class, grade, size and color.
- B. Storage of Materials, Equipment and Fixtures: Store materials suitably sheltered from the elements, but readily accessible for inspection until installed. Store all items subject to moisture

damage in dry, heated spaces. Provide space requirements for storage in submittals list. Storage space shall be assigned by the General Contractor.

- C. Store all materials in a secure fashion to prevent the loss of these materials due to pilferage or theft.

1.09 COORDINATION OF THE WORK

- A. Certain materials to be installed under this Contract may be supplied by the City of New York. Examine the Contract Documents to ascertain these items.
- B. Carefully check space requirements and the physical confines of the area of work to insure that all material can be installed in the spaces allotted thereto, including equipment racks, and cable supports.
- C. Transmit to other trades in a timely manner all information required for work to be provided under their respective Sections in ample time for installation.
- D. Wherever work interconnects with or contacts the work of other trades, coordinate with other trades to insure that all trades have the information necessary so that they may properly install all the necessary connections and equipment. Identify all items of work that require access so that the floor tile trade shall know where to install tile cutouts.
- E. Due to the type of installation, a fixed sequence of operation is required to properly install the complete systems. Coordinate project and schedule work with the General Contractor in accordance with the construction sequence. Provide progress status of the installation to the General Contractor to allow them to update their project schedules.
- F. Attend all construction meetings, at the project site or at other location, as requested by the City of New York or General Contractor.
- G. When directed by the City of New York, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper compliance with the design intent.

1.10 CODES, REGULATIONS AND STANDARDS

- A. The installation shall be in compliance with the requirements of the National Electrical Code, OSHA, recommendations and the rules, regulations and requirements of Federal Communications Commission.
- B. The installation shall comply fully with all county, city, and state laws and ordinances, regulations and codes applicable to the installation.
- C. Local electrical and building codes may be differ with national codes. Follow the most stringent code or recommendations. Where there are instances of ambiguity, refer to the Commissioner for interpretation.
- D. All equipment shall be equal to or exceed the minimum requirements of NEMA, IEEE, ASME, ANSI and Underwriters' Laboratories.

1.11 SPECIAL CONDITIONS

- A. The requirements and recommendations of all standards, specifications and codes referred to herein, including the telecommunications drawings, shall be considered a part of these specifications.
- B. Except as modified herein, the requirements and recommendations of the latest editions of the following documents are made part of these specifications:

1. EIA/TIA-568-B Series "Commercial Building Telecommunications Wiring Standard" with all amendments including but not limited to EIA/TIA-568-B.1, EIA/TIA-568-B.2, EIA/TIA-568-B.3.
 2. EIA/TIA-569-B "Commercial Building Standard for Telecommunications Pathways and Spaces".
 3. EIA/TIA-606-A "Administration Standard for the Telecommunications Infrastructure of Commercial Buildings".
 4. EIA/TIA – 607-A "Commercial Building Grounding and Bonding Requirements for Telecommunications".
- C. All local fees and permits and services of inspection authorities shall be obtained and paid for by the Contractor. The Contractor shall cooperate fully with local utility companies with respect to their services. Contractor shall include in his price, all costs to be incurred relative to the furnishing and installation of the system described herein.

1.12 WARRANTY

- A. Provide a warranty in accordance with the Contract Documents.
- B. All work and all items of equipment and materials shall be warranted for a minimum period of one year from the date of acceptance of the work. The Contractor shall, upon notification of any defective items, repair or replace such items within 24 hours without cost to the City of New York, all to the satisfaction of the City of New York/Commissioner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Where specific items are called out in the specification or indicated on the drawings for a specific application, use those products or materials. Otherwise use first class products and materials that have been approved by the City of New York/Commissioner at the time of bid.
- B. The part numbers provided in this section have been coordinated with the latest manufacturers product literature, and are accurate at the time of writing. They are, however, subject to change by the manufacturers at any time. If a specific part number is invalid or conflicts with component description, provide product from same or approved manufacturer meeting component description.

1. 4 PAIR UTP CABLE

- a. Four (4) twisted pairs of solid, 24 AWG, copper conductors. Each conductor individually insulated. Overall blue plenum (type CMP) outer jacket.
- b. Minimum mechanical and electrical characteristics: Equal to or better than individual characteristics established in EIA/TIA 568B for Category 6 cable.

NOTE: All Category 6 UTP cables shall be factory tested and qualified to Category 6 limits. Factory test data for each reel of Category 6 UTP cable shall be submitted to the City of New York/Commissioner for review at least one week prior to installation.

2. 100 PAIR HIGH PAIR COUNT UTP CABLE

- a. Multiple twisted pairs of solid 24 AWG copper conductors formed into 25 pair groups. Each conductor individually plastic insulated. Plastic tape core wrap under corrugated aluminum sheath. Overall plenum rated (type CMP) outer jacket.

- b. Minimum mechanical and electrical characteristics: Equal to or better than individual characteristics established in EIA/TIA 568B for Category 3 backbone cable.
3. 8-PIN MODULAR JACKS
- a. 8-pin modular flush mounted female jacks capable of terminating both solid and stranded conductors. Jacks mount into a molded plastic faceplate.
 - b. Minimum mechanical and electrical characteristics: Equal to or better than individual characteristics established in EIA/TIA 568B for Category 6 termination and modular connecting hardware.

4. FACEPLATES

Colors specified in this section must be verified with Commissioner prior to purchase.

- a. One position faceplate:
 - 1) Accommodates 1 flush mounted connector. Attached to standard single gang flush-mounted plastic ring or NEMA box UON.
 - b. Two position faceplate:
 - 1) Accommodates 2 flush mounted connector. Attached to standard single gang flush-mounted plastic ring or NEMA box UON.
 - c. Four position faceplate:
 - 1) Accommodates 4 flush mounted connectors. Attaches to standard single gang flush-mounted plaster ring or NEMA box UON.
 - d. Wall Phone Outlet:
 - 1) Accommodates 1 flush mounted connector for single or wall telephone outlet. Complete with stud inserts for wall telephone mounting Applications. Attached to standard single gang flush mounted plaster ring or NEMA box.
 - e. Modular Mounting Frames (for floor and conference table mounted outlets)
 - 1) Mounting frame for applications (flush floor mounted telecommunications outlets) where modular ports are required within standard "106/NEMA-style" openings. Capable of accommodating quantity of modular jacks as specified herein.
5. 110 TYPE TERMINATION BLOCK
- a. Field terminated 110A type termination block, complete with mounted hardware, designation strips, wire guides, 4 or 5 pair connecting blocks, as required.
 - b. Minimum mechanical and electrical characteristics. Equal to or better than individual characteristics established in EIA/TIA 568-B for category 3. termination and modular hardware.

6. MODULAR PATCH PANELS

- a. 48 Port Category 6 Modular Patch Panel

- 1) 568-A/B Pinning Styles. Category 6 compliant. High density layout. Steel plate with provisions for labeling on panel face. Mounts to 19" wide, EIA 310C compliant drilled frames. With faceplate provisions for placement of EIA/TIA 606-A compliant labels.
7. WIRE MANAGEMENT HARDWARE
 - a. Rack Mountable Anodized Aluminum Panels.
 - 1) Complete with split "D"-type wire management rings with waterfall. Mounts to 19" wide, EIA 310C compliant drilled frames.
8. EQUIPMENT RACKS
 - a. 84" high X 19" wide self support equipment rack. All aluminum construction with EIA 310C compliant mounting holes, black finish. Double sided
9. LABELS
 - a. Preprinted, smear proof, self adhesive labels. Provide sizes as required for each cable and outlet type.
10. FIRE STOPPING
 - a. Reusable heat expanding bags. Materials FM approved and UL classified for application. Asbestos free.
 - b. Non hardening, permanently pliable fire stop putty. Water resistant material containing no solvents, inorganic fibers or silicone. UL classified for up to two hours for application intended.
11. CABLE TIES
 - a. Re-enterable velcro-type cable ties for bundling cabling as required and securing cable bundles to racks as required. Attach to backboards using flat headed screws with rigid support. Lengths vary as required. Types vary as required.
12. SPIRAL WRAPPING
 - a. Flexible polyethylene protective wrapping (cut tubing). Natural clear color. Size as required.
13. "J" HOOKS
 - a. 1" wide. 2" ID for attachment to beam flanges, "U" channel, purlins, deck plates, smooth or threaded rod for cable support in ceilings and beneath access floors. provide every 5' OC (max) for open cable runs. Do not fasten to hung ceiling support structures.

PART 3 - INSTALLATION

3.01 GENERAL INSTALLATION PRACTICES

- A. Follow manufacturers' instructions for installing, connecting, and adjusting all telecommunications cabling and other equipment.
- B. Submit three (3) copies of such instructions to The City of New York/Commissioner before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Where no instructions are included with the equipment, follow accepted industry practices.
- C. Examine and compare the Telecommunication drawings and Specifications with the drawings and specifications of other trades; report any discrepancies between them to the City of New York and obtain from him written instructions for changes necessary in the work.
- D. Install and coordinate the Telecommunications work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interferences in a manner accepted by the General Contractor. All repairs or changes required in the work of the Contractor, caused by his neglect, shall be made by him at his own expense.
- E. The locations of outlets, equipment racks and other equipment indicated on the drawings are approximately correct and are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed.
- F. Exercise particular caution with reference to the location of equipment racks, terminations blocks, outlets, etc. and have precise and definite locations accepted by the City of New York before proceeding with the installation.
- G. Telecommunication cables running parallel to electrical cables/conduits shall be separated by a minimum of 12" horizontal separation.
- H. Telecommunications cables which must cross electrical cables/conduits shall do so only at 90 degree angles with a minimum of 12" vertical separation.
- I. To avoid electromagnetic interference (EMI), all cables shall be routed in such a way as to maintain the following minimum distance from possible sources of EMI:
 - 1. 3" from power lines of 2KVA or less installed in conduits or grounded flexible armor below access floors.
 - 2. 3" from fluorescent fixtures with remotely installed ballasts.
 - 3. 5" from power lines 2 KVA or less.
 - 4. 12" from power lines of between 2 to 5 KVA.
 - 5. 12" from high voltage lighting, including fluorescent lighting.
 - 6. 36" from power lines of 5 KVA or greater.
 - 7. 36" from transformers or motors.
- J. The Contractor shall maintain a current copy of this bid specification at the job site at all times.
- K. The Contractor shall maintain a complete file of shop drawings and other submissions at the job site at all times. These shop drawings and submissions shall be made available to the City of New York at his request.

- L. Keep all items protected before and after installation, with dust and moisture proof barrier materials. It shall be the contractor's responsibility to ensure the integrity of these protective measures throughout the life of the project.
- M. Ensure that safe ingress and egress from all work sites is maintained during movement and installation of materials.
- N. Clean up all debris generated by installation activities. Keep work areas free of debris at all times.
- O. Perform all tests required by local authorities in addition to tests specified herein.
- P. Deliver to The City of New York two sets of all special tools specifically needed for proper termination, operation, adjustment and maintenance of cable and cable termination hardware installed under this Contract.
- Q. At all times during the construction, the Contractor shall protect all equipment from damage and theft.
- R. Upon project completion, provide as-built drawings and documentation as defined herein.

3.02 STAFFING

- A. The Contractor shall keep a qualified foreman in charge of the work at all times. The foreman shall be present in the field at all times during the performance of the work. Such foreman shall be replaced if deemed to be unsatisfactory by the City of New York.
- B. The Contractor shall designate in writing to the City of New York that the full time foreman shall serve as a contact for resolution of problems, job coordination, additions, changes, etc. The Contractor's foreman shall have full authority to represent the Contractor in making decisions and executing the work in an acceptable manner.
- C. The Contractor shall provide a supervisory work force sufficient to efficiently execute the Contractor's responsibilities.
- D. The Contractor shall provide the level of manpower necessary to meet all construction schedules.
- E. The Contractor shall use only skilled, experienced and reliable workers and shall discontinue the services of anyone employed on this project upon written request of the City of New York.
- F. Craft personnel shall be qualified to perform the work activities and be knowledgeable of the following:
 - 1. Color coding of standard American telephone cables
 - 2. Installation and bonding of ground bars and conductors and bonding and grounding of equipment racks
 - 3. Testing conductors for electrical continuity
 - 4. Testing conductor insulation
 - 5. Termination, connectorization, and testing of unshielded twisted pair and optical fiber cables on all of the specified connectors and termination blocks.
 - 6. Telecommunications industry cable installation standards and manufacturer's instructions shall be used for in process quality control and final acceptance of the work installation.
 - 7. Craft personnel shall be required to provide and use the proper tools and test equipment in the performance of each activity. Tools must be in good working order and test

equipment must be properly calibrated. Contractor is responsible for safe storage of tools, and is responsible for their security.

3.03 INSTALLATION OF CABLING SYSTEMS

- A. All horizontal and backbone cables shall be installed between termination locations as uninterrupted conductor sections in accordance with these Specifications, the manufacturer's recommendations, and the accompanying Drawings. There shall be no splices or mechanical couplers installed between the cable points of origin and destination.
- B. Minimum bend radius for cables shall be as follows:
 - 1. For Category 6 UTP cables, patch cords, coaxial cables, and cross connect wire: 6 times the cable diameter.
 - 2. For high pair count UTP cables: 10 times cable diameter
- C. Maximum pulling tension for cables shall be as follows:
 - 1. For Category 6 UTP cables: 25 lbs.
 - 2. For high pair count UTP cables: 200 lbs
- D. Cables shall not be kinked during or after installation.
- E. All cables shall be protected from damage by other trades during, and subsequent to, installation. The City of New York/Commissioner reserves the right to direct the contractor to replace, at no additional cost to the contract, any and all cables that have, in the opinion of the City of New York/Commissioner, suffered mechanical damage during installation.
- F. Except as noted herein, cables, patch cords and cross connect wires shall be run loose within pathways and not bundled or tie wrapped together in any way. Cables bundled together for installation purposes shall be separated subsequent to installation.
- G. Maintain each individual cable's sheath up to the points of termination by removing only as much cable sheath as is necessary and practical to terminate the cables.
 - 1. For Category 6 cables, a maximum of 1/2" of cable sheath may be removed to accomplish cable termination.
- H. Maintain pair integrity of individual cable pairs by untwisting pairs only as much as is necessary and practical to terminate the cables. Original cable pair twists shall be maintained to within 1/2" of the pair termination point.
- I. **CABLE AND CONNECTOR INSTALLATION**

- 1. **Horizontal Cabling**

- a. **General**

From the point where the cable exits the ITR room to the point of termination in the work area outlet, the cables shall be supported by "J" hooks (provided under this contract) supported on 1/4" threaded rods attached directly to the underside of the slab above. In no case shall "J" hooks be attached to the ceiling support grid, sprinkler pipes, duct work, ductwork supports or electrical conduits in the ceiling. "J" hooks shall be spaced at a maximum distance of 5' on center and located no more than 12' above the top of the ceiling grid. A maximum of 40 Category 6 cables shall be supported by any single "J" hook.

b. Duplex Flush Wall Mounted Telecommunications Outlet

- 1) For each duplex flush wall mounted telecommunications outlet provide (2) two 4-pair Category 6 UTP cables.
- 2) All cables shall be run home run from the workstation outlet location (terminated with an 8-pin modular connector) to the ITR (terminated on Category 6 48 port modular patch panels).
- 3) Cables shall be routed from the ITR to the conduit stub-up via the 'J'-hook system. Cables shall then be run vertically within the wall cavity utilizing the conduit stub up and outlet box provide for this purpose. Each cable shall be terminated and mounted into a faceplate.

c. Quad Flush Wall Mounted Telecommunications Outlet

- 1) For each quad flush wall mounted telecommunications outlet provide (4) four 4-pair Category 6 UTP cables.
- 2) All cables shall be run home run from the workstation outlet location (terminated with an 8-pin modular connector) to the ITR (terminated on Category 6 48 port modular patch panels).
- 3) Cables shall be routed from the ITR to the conduit stub-up via the 'J'-hook system. Cables shall then be run vertically within the wall cavity utilizing the conduit stub up and outlet box provide for this purpose. Each cable shall be terminated and mounted into a faceplate.

d. Wall Mounted Phone Outlet

- 1) For each wall mounted phone outlet provide one (1) 4-pair, Category 6 UTP cable.
- 2) Cables shall be run home run from the outlet location (terminated with an 8-pin modular connector) to the ITR (terminated on Category 6 48 port modular patch panels).
- 3) Cables shall be routed from the ITR to the conduit stub-up via the 'J'-hook system. Cables shall then be run vertically within the wall cavity utilizing the conduit stub up and outlet box provide for this purpose. At each wall mounted telephone location, terminate the single 4 pair cable on the connector attached to the wall mounted telephone bracket and mount the bracket onto the outlet box.

e. Flush Floor Mounted Telecommunications Outlet

- 1) For each flush floor mounted quad telecommunications outlet provide (4) four 4-pair Category 6 UTP cables.
- 2) All cables shall be run home run from the flush floor mounted telecommunications outlets location (terminated with an 8-pin modular connector) to the ITR (terminated on 48 port modular patch panels).
- 3) Cables shall be routed from the ITR to a building column closest to the floor box being fed via "J"-Hooks. Cables shall then be run down the column and into the slab to the flush floor mounted telecommunications outlet via conduit provided for the purpose. Each cable shall be terminated and mounted into a modular mounting frame.

f. Wireless Access Point Telecommunications Outlets

- 1) For each wireless access point telecommunications outlet provide one (1) 4-pair, Category 6 UTP cable.
- 2) Cables shall be run home run from the outlet location (terminated with an 8-pin modular connector) to the ITR (terminated on Category 6 48 port modular patch panels).
- 3) Cables shall be routed from the ITR, via the 'J'-hook system, to a backbox and conduit stub mounted on u-channel above the suspended ceiling provided for this purpose. Cable shall be terminated and mounted into a faceplate within backbox.

2. High Pair Count UTP Tie Cabling

a. Provide High Pair Count UTP Tie cabling within ITR as noted on the drawings.

- 1) Cables shall be tied at 3' intervals to the vertical cable tray provided for this purpose.
- 2) Vertical cable runs shall be supported at each floor utilizing split-basket mesh type grips anchored to the slab above the riser sleeves.
- 3) Within the ITR, cables shall be run within ladder rack above provided for this purpose.
- 4) Tie UTP cables shall be terminated on 110A type termination blocks and 48 ports patch panels within the ITR.

J. 110 TERMINATION BLOCK INSTALLATION

1. 110A type blocks shall be furnished and installed, as indicated on the drawings, onto fire rated plywood. All blocks shall be provided with designation strips and wire management rings/clips. All blocks must be provided complete with 4 pair connector blocks for 4 pair cable terminations, 5-pair connector blocks for high pair count cable termination and all necessary mounting hardware. All unused connector blocks shall be turned over to the City of New York at the project's completion.

K. CABLE TERMINATION ON 110 BLOCKS

1. Terminate UTP cables on 110 blocks as indicated herein and on the drawings.
2. Cable terminations shall be in accordance with the hardware manufacturers printed instructions and the requirements of EIA/TIA-568-B, depending on the Category of the cable being terminated.
3. Provide wire management hardware as indicated herein and on the drawings.

L. MODULAR PATCH PANEL INSTALLATION

1. Provide 48 port modular patch panels, complete with installation kits, 8 pin modular connectors, and all necessary mounting hardware in each equipment rack as shown on the drawings.
2. Patch panels shall be mounted in each rack as indicated on the drawings.

M. CABLE TERMINATION ON MODULAR PATCH PANELS

1. Terminate 4-pair UTP cables on the 110 style termination hardware on the back of the connectors mounted in the modular patch panels.
2. Terminate high pair UTP cables on the 110 style termination hardware on the back of the connectors mounted in the modular patch panels. Two (2) pairs, utilizing USOC pinning, shall be terminated per modular port.
3. After dressing cables to their final location in the patch panel the sheath shall be removed to a point that allows for proper termination in a neat and uniform fashion. Every effort shall be made to maintain sheath integrity by removing only as much as is practical to accomplish the cable termination. A maximum of 1/2" of cable sheath shall be removed from 4 pair UTP cables.
4. Care shall be taken to maintain pair integrity by untwisting cable pairs only as much as is necessary and practical to accomplish the cable termination. Original cable pair twists shall be maintained to within at least 1/2" of the point of termination.

N. STRAIN RELIEF

1. For all cable terminations on punch blocks or in patch panels, provide a single point of strain relief, utilizing velcro-type re-enterable cable ties, for all cables (25 pairs or less) at the point where they enter the block or patch panel. Secure the cable tie to the patch panel, punch block or backboard as necessary to ensure adequate strain relief. For high pair count cables, provide this type of strain relief for individual 25 pair binder groups.

O. EQUIPMENT RACK INSTALLATION

1. Racks shall be installed in accordance with the manufacturers printed instructions. Racks shall be bolted to the floor. Racks adjacent to each other shall be bayed together as per manufacturers instructions.

P. GROUNDING

1. All racks installed under this work, and all racks into which patch panels, cables or other equipment are installed, shall be bonded to the nearest solid copper ground bar utilizing an insulated, stranded, uninterrupted 6 AWG grounding conductor.
2. Conductors shall be mechanically bonded to racks, cabinets and the ground bar with two hole grounding lugs which have been hydraulically crimped onto the conductor.

Q. IDENTIFICATION AND LABELING

1. Provide pre-printed name plates, labels or other identification media, at locations noted herein or as indicated on the drawings, for all cables, racks, termination hardware, patch panels, outlets, boxes, etc. provided or installed under this work.
2. Where specific locations of labels or nameplates are not shown on the drawings, obtain locations from The City of New York/Commissioner.
3. Coordinate all labeling and nameplate requirements with the City of New York/Commissioner and submit name plate and label samples to The City of New York/Commissioner for approval prior to installation.
4. Cable and/or component ID's on all labels and nameplates shall be machine printed. Hand lettered labels or nameplates are only acceptable for use as temporary labeling during construction and will not be accepted for final installation.

5. If at any time during the project a label or nameplate becomes illegible, or is removed from a cable or rack, the Contractor shall immediately replace it with a duplicate preprinted label or nameplate.
6. All labels and nameplates shall be placed so as to be both physically and visually accessible at all times.
7. Labels and designation strips for all cables, cable termination hardware and patch panels shall be color coded for easy identification.
 - a. Label and designation strip color coding shall be as follows.
 - 1) Horizontal cables and cable termination hardware: Blue
 - 2) Backbone cables and cable termination hardware: White
 - 3) Equipment cables and cable termination hardware: Purple
8. Cable labels
 - a. Permanent, adhesive-backed cable labels shall be provided for all cables furnished and installed under this work.
 - b. Labels shall be of the types and sizes necessary to accommodate the size and physical characteristics of each cable type.
 - c. Labels shall be placed on both ends of the cable and no more than 6" from the point at which the cable is broken out into individual conductors.
 - d. Label shall be printed with black uppercase lettering on a permanent adhesive label stock. Label shall be of a kind appropriate for the cable type and shall be covered with a permanent water resistant sealer.
 - e. Labels shall be printed with the cable ID of attached cable.
9. Nameplates
 - a. Nameplates shall be provided for all racks, frames, patch panels and cross connect fields provided or installed under this work.
 - b. Nameplates shall be sized as required to contain the required information.
 - c. Utilize a lamacoid or aluminum plate with beveled edges and a black enamel background. Lettering to be etched or engraved upper case white letters 1-1/2" high.
 - d. Nameplates shall be bolted onto racks and cabinets countersunk bolts or screwed onto plywood backboards with countersunk wood screws.
10. Designation strips
 - a. Designation strips shall be provided for all patch panels.
 - b. Designation strips shall be printed as follows.
 - 1) For horizontal cable terminations: cable and outlet box/patch panel ID's for each cable.
 - 2) For backbone cables: cable ID and pair/fiber count for each cable.

- 3) For equipment cables: cable and equipment cabinet ID for each cable.
- c. Provide clear plastic holder over designation strips subsequent to installation.
- 11. Adhesive backed labels.
 - a. Permanent, adhesive backed labels shall be provided for all surface mounted outlet boxes, all face plates and all patch panels.
 - b. Labels shall be printed with black uppercase lettering on a permanent adhesive label stock. Labels shall be covered with a permanent water resistant sealer.
 - c. Labels shall be printed as follows.
 - 1) For faceplates: individual labels for each cable showing cable ID.
 - 2) For patch panels: single label with the patch panel ID and individual labels for each port showing cable ID.
- 12. See drawings for label placement on faceplates and patch panels.
- 13. See cable pull schedules for exact label id on faceplates, patch panels and cabling.

R. INSPECTIONS AND TESTING

- 1. After the installation is complete the Contractor shall test, as described below, all cables and components installed under these specifications.
- 2. Provide sufficient skilled labor and quantities of each type of test set or test tool to complete testing within the agreed upon test period. All test sets or tools of a given type shall be from the same manufacturer.
- 3. In addition to the required tests as described herein, and at such times as the City of New York directs, the Contractor shall be present while the City of New York conducts an operating test for approval. The installation shall be demonstrated to be in accordance with the requirements of this specification. Any defects revealed shall be corrected promptly at the Contractor's expense and the tests performed again.
- 4. The City of New York/Commissioner reserves the right to observe the conduct of any or all portions of the testing process. Notify the City of New York/Commissioner 1 week in advance of any testing.
- 5. The City of New York/Commissioner further reserve the right to conduct, using contractor equipment and labor, a random re-test of up to five (5) percent of the cable plant to confirm documented test results. Such retests may be observed and reported on by a third party contractor retained by the City of New York/Commissioner.
- 6. Unless otherwise noted, all link performance tests shall be end-to-end tests through all cross connects or patches. Test data for partial link segments shall not be acceptable.
- 7. The City of New York/Commissioner reserve the right to require a re-test, at no additional cost to the City of New York, of all cables not tested in accordance with the test procedures outlined below.
- 8. Pre-installation testing
 - a. Visually inspect all cables, cable reels, and shipping cartons to detect cable damage incurred during shipping and transport. Return visibly damaged items to the manufacturer.

- b. Where post-manufacturer test data for high pair count UTP has been provided by the manufacturer on the reel or shipping carton: submit copies to the City of New York/Commissioner for review prior to installing cables.
 - c. Submit post manufacturer test data for each reel of Category 6 UTP and optical fiber cable. As a minimum, such test data shall include NEXT and attenuation data for Cat 6 UTP. Mark reels as tested/inspected and submit associated test results to City of New York.
9. Post installation testing
- a. Upon completion of the installation, conduct individual cable and link performance testing as described below.
 - b. Sub Category 6 link performance testing.
 - 1) Test all high pair count UTP cables as described below.
 - 2) Test each cable pair for continuity, ground fault, shorts and crossed pairs.
 - 3) Re-terminate cables/connectors to correct crossed pairs and re-test link.
 - 4) For cables with 25 pairs or less: replace entire cable if open short or ground fault is found.
 - 5) For cables with more than 25 pairs: replace entire cable if 1% or more open, short or ground fault pairs are found.
 - c. Category 6 link performance testing.
 - 1) Conduct link performance and other tests of all Category 6 links as described below. All cables shall be tested bi-directionally, unless otherwise noted.
 - 2) Conform with the testing requirements set forth in the EIA/TIA 568-B.
 - 3) Test all cables bidirectionally between modular patch panels in the ITS and work area outlet.
 - a) Provide factory assembled Category 6 test-adapter-module-to-8 pin patch cord to perform tests.
 - b) Link performance testing shall be conducted with a hand held EIA/TIA Level III Category 6 test sets utilizing active remote reference at the far end of the link.
 - i) The test set and active remote reference combination shall be utilized, and tests conducted, in accordance with the test set manufacturers printed instructions.
 - ii) The minimum number of patch cables necessary to interface the test equipment to the cable plant shall be utilized with the test sets. Where available, actual equipment mounting and patch cords to be used in the installation shall be utilized and tested.

- iii) Patch cables, where required, shall be mated with the test set and active signal injector for the duration of the testing period.
 - iv) Patch cables used during the test shall be kept as straight as possible. Do not leave patch cables coiled during the conduct of the test.
 - v) Each test set and active signal injector combination shall be calibrated, as per the manufacturers printed instructions, at the beginning of each day's testing.
 - vi) Test sets shall be fully charged prior to each days testing.
- c) Attenuation and Near End Cross Talk (NEXT) tests shall be conducted across the entire Category 6 frequency range as defined in EIA/TIA-568-B.
 - d) Test each pair of each cable for continuity, ground fault, shorts and crossed pairs. Re-terminate cables/connectors as required to correct crossed pairs. Replace entire cable if open, short or ground fault is found.
 - e) Test each pair of each cable for attenuation. Re-terminate or replace cable and/or termination hardware, as required, if any pair is found to have a measured attenuation, in dB (normalized to 100 meters) worse (higher than) than that permitted in EIA/TIA-568-B for Category 6 links.
 - f) Perform a Time Domain Reflectometry test on each pair of each cable to measure overall pair length.
 - g) Perform an ambient noise measurement test on each cable pair.
 - h) Perform a NEXT measurement for all six (6) possible pair combinations. Re-terminate or replace cable and/or termination hardware, as necessary, if any one pair combination is found to have a measured NEXT, in dB, worse than that specified in EIA/TIA-568-B for Category 6 links.
10. All test data, including documentation of failed tests, the corrective procedures performed and the results of re-tests, are to be documented and submitted to the City of New York in both printed hard copy and machine readable format within five (5) working days of test completion. Hand written test reports will not be accepted.
- a. Unless otherwise noted, all test data will be provided to the City of New York/Commissioner in either Microsoft Excel (*.XLS files) format.
11. Prior to testing, submit for review and approval by the City of New York/Commissioner copies of test report forms and data formats proposed for use.
- a. As a minimum, each printed test report shall contain the following general information:
 - 1) Project name, contractors name, type of test data included, date of test, date of report preparation, make, model and serial number of test equipment used, date of last calibration and names of test crew.

- b. Printed test reports for sub-Category 6 link testing shall contain, as a minimum, the following information for each cable test:
 - 1) Cable number, cable type, pair count, individual pair numbers and the results of each test for each pair.
 - 2) Report shall also contain a listing, by cable and pair, of failed tests and corrective measures taken.

- c. Printed test reports for Category 6 link testing shall contain, as a minimum, the following information for each cable test:
 - 1) Cable number and cable type.
 - 2) Direction of test.
 - 3) Results of continuity, shorts and crossed pair testing, including a "wire map" of the complete link.
 - 4) The length of each cable pair in feet.
 - 5) The ambient noise value, in mV RMS, measured for each pair.
 - 6) The worst case attenuation for each cable pair in dB.
 - 7) The worst case NEXT, in dB, for all six possible pair combinations, including the frequency, in MHz, at which the worst case NEXT occurred.
 - 8) The calculated Signal-to-Crosstalk ratio (SCR) for all six possible pair combinations.
 - 9) Clear indication of the status (pass or fail) of the cable.
 - 10) Report shall also contain a listing, by cable and pair, of failed tests and corrective measures taken

- d. In addition to printed test reports provide to the City of New York/Commissioner, in a format directly compatible with Microsoft Access relational data base system, copies of the data taken during the Category 6 link performance tests.
 - 1) Files shall be in the *.MDB file format.
 - 2) Each database file shall contain the bi-directional cable test data for one full floor.
 - 3) In addition to containing the data provided in the printed reports, the database file shall contain all other information capable of being downloaded from the test set.

- e. Printed test reports for optical fiber link testing shall contain the following information for each optical fiber test run.
 - 1) Cable number, cable type and fiber number.
 - 2) Direction of test.
 - 3) Measured signal attenuation in dB.

- 4) Calculated signal attenuation in dB.
- 5) Report shall also contain a listing, by cable and pair, of failed tests and corrective measures taken.

12. Test equipment:

- a. 4-Pair UTP automated cable tester: Tester shall be compliant with EIA/TIA Level III provide bi-directional testing and test to Level II standards for both basic links and channels. Test equipment type must be approved by Commissioner prior to use on the job. Fluke DTX CableAnalyzer is pre- approved.

S. ACCEPTANCE

1. Once the testing has been completed and the City of New York/Builder is satisfied that all work is in accordance with the Contract Documents, the City of New York shall notify the Telecommunications Contractor in writing of formal acceptance of the system.

T. FIRE STOPPING

1. Subsequent to cable installation, provide fire stopping at all vertical and horizontal wall or floor penetrations, as noted herein and on the drawings. All fire stop materials shall be installed in full conformance with the manufacturers printed installation instructions.
2. Conduits and riser openings, provide non-hardening fire stop putty, including any necessary damming or installation materials.
3. For all wall penetrations, provide removable intumescent fire stop bags. Provide wire mesh grate over bags as recommended by manufacturer subsequent to installation.

END OF SECTION 16750

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SECTION 16751

TELECOMMUNICATIONS PATHWAYS SYSTEM

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Work of this Section shall comply with Contract Documents, including General Conditions, and Supplemental General Requirements.
- B. The general conditions for contracts of construction, referred to in the contract documents as the general conditions, together with the following articles of the telecommunications cabling specifications, which amend, modify and supplement various articles and provisions of the general conditions, are made part of the Contract and shall apply to all work under the Contract.
- C. All articles or parts of articles of the general conditions not so amended, modified or supplemented by these telecommunications cabling specifications shall remain in full force and effect. Should any discrepancy become apparent between the general conditions and these telecommunications cabling specifications the Contractor shall notify The City of New York/Commissioner, in writing, and the City of New York/Commissioner shall interpret and decide such matters in accordance with the provisions of the General Conditions.
- D. The Contractor shall comply with all applicable governmental regulations and with all Federal, State, County, City, and other applicable codes and ordinances.
- E. These specifications call out certain duties of the Contractor and his suppliers. They are not intended as a material list of items required by the Contract.
- F. These divisions of the specifications cover the telecommunication pathway system for the Brooklyn Public Library Rugby Branch located at 1000 Utica Avenue, Brooklyn, NY.
- G. It is the intent of these specifications to provide a complete workable telecommunications cabling system ready for the City of New York's use. Any item not specifically shown on the drawings or called for in the specifications, but normally required to conform with the intent, are to be considered as part of the Contract.
- H. Any given item of equipment or material shall be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item shall not be permitted, unless specifically noted otherwise.
- I. These specifications are equipment and performance specifications. Actual installation shall be as indicated on the Drawings. Any discrepancies found between these Specifications and the Drawings shall be immediately brought to the attention of the City of New York. Installation and details indicated on the Drawings shall govern if they differ from the Specifications.

1.02 DEFINITION OF TERMS

- A. *Equipment* refers to any and all items, off-the-shelf or custom, used to assemble the system.
- B. *System* refers to, singularly and/or collectively, the complete, interconnected assemblage of equipment as specified and intended herein.
- C. *Herein* refers to both the drawings and specifications.
- D. *Conduit, or Cable Tray* means the inclusion of all fittings, hangers, supports, sleeves, etc.
- E. *Concealed* means embedded in masonry or other construction, installed behind wall furring or within double partitions, or installed within hung ceilings or under raised floor.

- F. *Exposed* means not installed underground or "CONCEALED" as defined above.
- G. *Approved* means as accepted and authorized, in writing, by the City of New York/Builder or Commissioner.
- H. *As Directed* means as directed by the City of New York or his representative.
- I. Refer to *Abbreviations* definitions on Drawings.

1.03 WORK SUMMARY

- A. General: The scope of work comprises the supply, installation, testing, commissioning, maintenance and defects liability service of materials, labor and equipment for the complete telecommunications pathways system installation.
- B. Work Included: The work includes, but is not necessarily limited to, the following:
 - 1. Overhead ladder racks in the IT Room (ITR).
 - 2. All supports, connectors, adapters, fittings, cable retaining posts, etc. necessary for complete and proper installation.
 - 3. Ladder rack, and equipment rack grounding.
- C. Related Work: The Following related items are specified in others Sections of the Specifications;
 - 1. Telecommunications Cabling (Provided under Section 16750).
 - 2. Telecommunications signal grounding system (Provided under Electrical).
 - 3. Wall mounted back boxes, receptacle boxes and floor boxes, including conduit stub-ups (Provided under Electrical).
 - 4. Floor boxes for the telecommunications systems (Provided under Electrical).
 - 5. All conduits, conduit sleeves and pull boxes for the telecommunication systems (Provided under Electrical).
 - 6. rovision of penetrations through beams, walls, floors, ceilings, roofs and cupboards for installation of cables and cable trays (Provided under architectural work).
 - 7. Provision of access panels in trimmed openings in ceilings and walls where required (Provided under architectural work).
 - 8. Provision of all patching, plastering, filling and making good of all penetrations, chases and openings for electrical services pertaining to the telecommunication system (Provided under architectural work).
 - 9. Fire stopping of all rated wall and floor penetrations (Provided under Section 16750).

1.04 SITE VISIT

- A. Prior to bid submission, the Contractor shall examine the drawings of other trades to determine the existing design conditions that may affect the work. The Contractor shall be held responsible for any assumptions in regard thereto.
- B. The Contractor shall verify all dimensions and distances in the field and document the cable tray lengths and materials to be furnished and installed. The provision and installation of non specified miscellaneous hardware, i.e., nuts, bolts, tie wraps, etc., shall also be the Contractor's responsibility.

- C. Contractor should note this is an existing facility under renovation. Existing site conditions, other contract documents and the overall construction schedule must be carefully reviewed to determine all required interfacing and timing of the work.
- D. Existing Contract Documents for all other trades shall be made available for review through the General Contractor.

1.05 CONTRACTOR QUALIFICATIONS

- A. Contractor shall have a minimum of 3 years experience in the installation of telecommunications cable tray systems of the type and size to be provided on this project.

1.06 QUALITY ASSURANCE

- A. All materials furnished shall be new and unused and free from defects. All materials shall meet all applicable codes provided a standard has been established for the material in question.
- B. All products and materials to be clean, free of manufacturers defects, and free of damage and corrosion.

1.07 SHOP DRAWING SUBMITTAL

- A. Submit within five working (5) days of notice to proceed the following items in accordance with the Contract Documents:
 - 1. Product Data
 - a. Three (3) sets of original manufacturer's product data sheets for all material and equipment proposed for use on this project. Only specified or accepted manufacturers or suppliers shall appear in the product data submittal.
 - b. Where product data sheets contain information on multiple products or product configurations, the specific item being submitted for approval shall be clearly marked.
 - 2. Shop Drawings
 - a. Two (2) reproducible vellum plot sets and three (3) blue line copies of each drawing (bound) showing:
 - 1) Detailed floor plans indicating location of cable trays, conduit runs, and sizes of cable trays and conduits, wall mounted outlets and poke-through fittings.
 - 2) Detailed plan views and elevations of the ITR showing: exact placement of under floor cable tray, and vertical cable tray sections in relationship to cabinets, equipment racks, lighting fixtures, riser shaft, duct work and diffusers, sprinkler piping, etc.
 - 3) Mounting and support details for all cable trays, and vertical cable tray sections showing each specific mounting and support condition.
 - 4) Drawings must show evidence of coordination with other trades.
 - 3. Individual submissions shall be provided for each specific material, system or equipment as identified herein. Submittals provided other than in this manner shall be returned without review.

4. All product data and drawings shall be submitted sufficiently in advance of field requirements to allow ample time for review and re-submittal as may be required. All submittals shall be returned without review.
5. Acceptance of any submittal data or shop drawing shall not relieve the contractor from responsibility for errors, omissions or inadequacies of any sort.
6. Each product data submittal shall contain the contractor's name, project number, project title and specific reference to the applicable drawing and specification section.

B. As-Built Documents

1. During construction, the Contractor shall keep an accurate record of all deviations between the work as shown on the drawings and that which is accurately installed.
2. Upon completion of work and acceptance by The City of New York/Commissioner, provide As-Built drawings of the complete system including, but not limited to, the following:
 - a. Scaled floor plans of the ITR showing the exact location and type of each cable tray and vertical cable tray section.
 - b. Scaled installation details showing each typical installation configuration.
 - c. As-built drawings shall be provided in both reproducible hard-copy (Vellum) and machine readable (AutoCAD V.2004) format.
 - d. Provide the City of New York/Commissioner with two (2) sets of Operation and Maintenance Manuals including:
 - e. Reduced-size (minimum 11" x 17") prints of all as-built drawings as described above.
 - f. Copies of all shop drawings.
 - g. Manufacturers original cut sheets for each component provided under this work.
 - h. Manuals shall be provided in a high quality, 3-ring binder and completely indexed. Submit manuals to the City of New York not more than 2 weeks after project completion.
3. Provide The City of New York with two (2) sets of Operation and Maintenance Manuals including installation diagrams, parts lists, shop drawings and manufacturers' information on all equipment and cables provided by the Telecommunications Contractor. Manuals shall be provided in a high quality, 3-ring binder and completely indexed. Submit manuals to the City of New York not more than 1 week after project completion.

1.08 CODES, REGULATIONS AND STANDARDS

- A. The installation shall be in compliance with the requirements of the National Electrical Code, OSHA, recommendations and the rules, regulations and requirements of Federal Communications Commission.
- B. The installation shall comply fully with all county, city, and state laws and ordinances, regulations and codes applicable to the installation.
- C. Local electrical and building codes may be differ with national codes. Follow the most stringent code or recommendations. Where there are instances of ambiguity, refer to the Commissioner for interpretation.

- D. Should any change in plans or specifications be required to comply with governmental regulations, the contractor shall notify the City of New York at the time of submitting this bid.

1.09 SPECIAL CONDITIONS

- A. The requirements and recommendations of all standards, specifications and codes referred to herein, including the telecommunications drawings, shall be considered a part of these specifications.
- B. Except as modified herein, the requirements and recommendations of the latest editions of the following documents are made part of these specifications:
 - 1. EIA/TIA-569-B "*Commercial Building Standard for Telecommunications Pathways and Spaces*".
 - 2. EIA/TIA-606-A "*Administration Standard for the Telecommunications Infrastructure of Commercial Buildings*".
 - 3. EIA/TIA - 607-A "*Commercial Building Grounding and Bonding Requirements for Telecommunications*".
- C. All local fees and permits and services of inspection authorities shall be obtained and paid for by the Contractor. The Contractor shall cooperate fully with local utility companies with respect to their services. Contractor shall include in his price, all costs to be incurred relative to the furnishing and installation of the system described herein.

1.10 WARRANTY

- A. Provide a warranty in accordance with the Contract Documents.
- B. All work and all items of equipment and materials shall be warranted for a minimum period of one year from the date of acceptance of the work. The Contractor shall, upon notification of any defective items, repair or replace such items within 24 hours without cost to the City of New York, all to the satisfaction of the City of New York/Commissioner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Where specific items are called out in the specification or indicated on the drawings for a specific application, use those products or materials. Otherwise use first class products and materials that have been approved by the City of New York/Commissioner at the time of bid. Products and materials substituted after the time of bid a subject to prior approval by the City of New York/Commissioner.
- B. The part numbers provided in this section have been coordinated with the latest manufacturers product literature, and are accurate at the time of writing. They are, however, subject to change by the manufacturers at any time. If a specific part number is invalid or conflicts with component description, provide product from same or approved manufacturer meeting component description.
 - 1. LADDER RACK
 - a. Steel, bar type cable rack. Hollow 2" side bars, 12" rung spacing. No side rails. 18" wide UON.
 - b. Complete with all necessary supports, hangers, retaining posts, connectors, nuts, bolts, etc. necessary for a complete installation.
 - 2. METAL FRAMING CHANNELS

- a. Cold Rolled "U" shaped framing channel. 12 Ga. (2.6mm) low carbon steel construction. 2-7/16" high by 1-5/8" wide. 9/16" x 7/8" slots 2" O.C.
 - b. Complete with all necessary hardware for complete installation.
 - c. Contractors option on meeting this specification.
3. SUPPORT RODS
- a. 1/4", 1/2" and 5/8" all threaded steel rods. Minimum tensile load capacity 240 lbs. (1/4"), 1130 lbs. (1/2") or 1810 lbs.(5/8").
 - b. Contractors option on meeting this specification.

PART 3 - INSTALLATION

3.01 GENERAL INSTALLATION PRACTICES

- A. Follow manufacturers' instructions for installing, connecting, and adjusting all cable trays, and other equipment.
- B. Submit three (3) copies of such instructions to The City of New York/Commissioner before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Where no instructions are included with the equipment, follow accepted industry practices.
- C. Examine and compare the Telecommunication drawings and Specifications with the drawings and specifications of other trades; report any discrepancies between them to the City of New York and obtain from him written instructions for changes necessary in the work.
- D. Install and coordinate the Telecommunications work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interferences in a manner accepted by the General Contractor. All repairs or changes required in the work of the Contractor, caused by his neglect, shall be made by him at his own expense.
- E. The locations of cable trays and other equipment indicated on the drawings are approximately correct and are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed.
- F. Exercise particular caution with reference to the location of cable trays and have precise and definite locations accepted by the City of New York before proceeding with the installation.
- G. Telecommunication cable trays running parallel to electrical cables/conduits shall be separated by a minimum of 12" horizontal separation.
- H. Telecommunications cable trays which must cross electrical cables/conduits shall do so only at 90 degree angles with a minimum of 12" vertical separation.
- I. To avoid electromagnetic interference (EMI), all cable tray shall be routed in such a way as to maintain the following minimum distance from possible sources of EMI:
 - 1. 3" from power lines of 2KVA or less installed in conduits or grounded flexible armor below access floors.
 - 2. 3" from fluorescent fixtures with remotely installed ballasts.
 - 3. 5" from power lines 2 KVA or less.
 - 4. 12" from power lines of between 2 to 5 KVA.

5. 12" from high voltage lighting, including fluorescent lighting.
 6. 36" from power lines of 5 KVA or greater.
 7. 36" from transformers or motors.
- J. The Contractor shall maintain a current copy of this bid specification at the job site at all times.
 - K. The Contractor shall maintain a complete file of shop drawings and other submissions at the job site at all times. These shop drawings and submissions shall be made available to the City of New York at his request.
 - L. Keep all items protected before and after installation, with dust and moisture proof barrier materials. It shall be the contractor's responsibility to ensure the integrity of these protective measures throughout the life of the project.
 - M. Ensure that safe ingress and egress from all work sites is maintained during movement and installation of materials.
 - N. Clean up all debris generated by installation activities. Keep work areas free of debris at all times.
 - O. Perform all tests required by local authorities in addition to tests specified herein.
 - P. Deliver to The City of New York two sets of all special tools specifically needed for proper termination, operation, adjustment and maintenance of cable and cable termination hardware installed under this Contract.
 - Q. At all times during the construction, the Contractor shall protect all equipment from damage and theft.
 - R. Upon project completion, provide as-built drawings and documentation as defined herein.

3.02 STAFFING

- A. The Contractor shall keep a qualified foreman in charge of the work at all times. The foreman shall be present in the field at all times during the performance of the work. Such foreman shall be replaced if deemed to be unsatisfactory by the City of New York.
- B. The Contractor shall designate in writing to the City of New York that the full time foreman shall serve as a contact for resolution of problems, job coordination, additions, changes, etc. The Contractor's foreman shall have full authority to represent the Contractor in making decisions and executing the work in an acceptable manner.
- C. The Contractor shall provide a supervisory work force sufficient to efficiently execute the Contractor's responsibilities.
- D. The Contractor shall provide the level of manpower necessary to meet all construction schedules.
- E. The Contractor shall use only skilled, experienced and reliable workers and shall discontinue the services of anyone employed on this project upon written request of the City of New York.

3.03 INSTALLATION OF PATHWAY SYSTEMS

A. LADDER RACKS

1. Overhead ladder racks shall be provided in the ITR as noted on the drawings.
2. Overhead ladder racks shall be supported a minimum of every 5' on center and at the end of every ladder rack run, utilizing trapeze types supports, attached directly to the slab above.

3. Overhead ladder racks shall be installed 7'-6" AFF, unless otherwise noted.
4. Trapeze supports shall consist of a horizontal framing channel attached directly to the slab above with a minimum of two (2) continuous (un-spliced) 1/2" threaded rods.
 - a. Attach threaded rods to framing channel with two nuts, and saddle washer at lower nut, as indicated on the drawings.
 - b. Anchors for threaded rods shall be countersunk into the thickest parts of the floor slab. Extend length of metal framing channel, as required, to ensure rods are anchored in thickest sections of slab.
5. Ladder racks shall be secured to each horizontal framing channel with two (2) "J" bolts as indicated on the drawings.
6. Coordinated placement of ladder racks and supports with duct work, conduits, piping, lighting fixtures, etc.
7. Coordinate placement of supports with ceiling trades and transmit information regarding necessary ceiling penetrations to them in a timely manner. Ceiling cuts provided by others.

B. FIRE STOPPING

1. Fire stop all rated wall penetrations in accordance with all applicable local, state and national codes.

C. GROUNDING

1. Ladder racks and vertical cable trays shall be grounded in accordance with all local code requirements and in accordance with EIA/TIA - 607-A "*Grounding and Bonding Requirements for Commercial Building Telecommunications Systems*".
2. Provide braided copper ground straps between adjoining sections of ladder racks and vertical cable trays. Mechanically bond ground straps to each section of ladder racks and vertical cable trays.
3. Where ladder racks and vertical cable trays are painted, remove paint down to bare metal before attaching ground straps.
4. Provide a continuous, stranded, insulated #6 AWG ground conductor between the ladder racks and vertical cable trays and the telecommunications ground bar in each IDF.

END OF SECTION 16751

SECTION 16800

ELECTRONIC SECURITY SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work of this Section shall comply with Contract Documents, including DDC General Conditions.
- B. The General Conditions for contracts of construction, referred to in the contract documents as the General Conditions, together with the following articles of the electronic security systems specifications, which amend, modify and supplement various articles and provisions of the general conditions, are made part of the Contract and shall apply to all work under the Contract.
- C. All articles or parts of articles of the General Conditions not so amended, modified or supplemented by these electronic security systems specifications shall remain in full force and effect. Should any discrepancy become apparent between the general conditions and these electronic security systems specifications the Contractor shall notify Engineer, in writing, and the Engineer shall interpret and decide such matters in accordance with the provisions of the General Conditions.
- D. The Contractor shall comply with all applicable governmental regulations, Standards and with all State, County, City, and other applicable codes and ordinances.
- E. These specifications call out certain duties of the Contractor and his suppliers. They are not intended as a material list of items required by the Contract.
- F. It is the intent of these specifications to provide a complete workable electronic security system ready for the City of New York's use. Any item not specifically shown on the drawings or called for in the specifications, but normally required to conform to the intent, are to be considered as part of the Contract.
- G. Any given item of equipment or material shall be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item shall not be permitted, unless specifically noted otherwise.
- H. These specifications are equipment and performance specifications. Actual installation shall be as indicated on the Drawings. Any discrepancies found between the Specification and the Drawing shall be immediately brought to the attention of the commissioner. Installation and details indicated on the Drawings shall govern if they differ from the Specifications.
- I. Certain terms such as "shall, provide, install, complete, start up" are not used in some parts of these specifications. This does not indicate that the items shall be less than completely installed or that systems shall be less than complete.

1.02 DEFINITION OF TERMS

- A. *Equipment* refers to any and all items, off-the-shelf or custom, used to assemble the system.
- B. *System* refers to, singularly and/or collectively, the complete, interconnected assemblage of equipment as specified and intended herein.
- C. *Conduit, Cable Tray or Ladder Rack* means the inclusion of all fittings, hangers, supports, sleeves, etc.

- D. *Concealed* means embedded in masonry or other construction, installed behind wall furring or within double partitions, or installed within hung ceilings or under raised floor.
- E. *Exposed* means not installed underground or "CONCEALED" as defined above.
- F. Refer to *Abbreviations* definitions on Drawings.
- G. Owner shall refer to the City of NY.

1.03 WORK SUMMARY

- A. General: The scope of work comprises the supply, installation, testing, commissioning, maintenance and defects liability service of materials, labor and equipment for the complete electronic security system installation.
- B. Proprietary Item: 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.
 - 1. Allowance Amount: Not to Exceed \$18,000
 - 2. 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. Work Included: The work includes, but is not necessarily limited to, the following:
 - 1. Provide labor and materials required to design, procure, deliver, install, test, train, commission, program and place into operation the electronic security systems as called for in the contract documents, and according to applicable codes and regulations.
 - 2. Furnish and install all labor, materials, apparatus, and appliances essential to the complete functioning of the systems described and/or indicated herein, or which may be reasonably implied as essential whether mentioned in the Contract Drawings and Specifications or not.
- D. Related Work: The following related items are specified in others sections of the specifications;
 - 1. Cable tray, ladder rack (Provided under Section 16751).
 - 2. Telecommunications signal grounding system (Provided under Electrical).
 - 3. Wall mounted back boxes, receptacle boxes and floor boxes, including conduit stub-ups (Provided under Electrical).
 - 4. All conduits, conduit sleeves and pull boxes for the electronic security system (Provided under Electrical).
 - 5. Plywood backboards (Provided under architectural work).

6. Provision of penetrations through beams, walls, floors, ceilings, roofs and cupboards for installation of cables and cable ladders/trays (Provided under architectural work).
7. Provision of access panels in trimmed openings in ceilings and walls where required (Provided under architectural work).
8. Provision of all patching, plastering, filling and making good of all penetrations, chases and openings for electrical services pertaining to the electronic security system (Provided under architectural work).

1.04 MANUFACTURERS QUALIFICATIONS

- A. The Manufacturer providing the material or equipment specified in this section must, for the past five (5) years, have been regularly engaged in the manufacture of material or equipment similar in type to that required for this project. Such similar material or equipment provided by the manufacturer must have been in satisfactory service for not less than five (5) years.

1.05 CONTRACTOR QUALIFICATIONS

- A. The Contractor performing the Work of this Section must, within the last five (5) consecutive years, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work for this Section.
- B. The Contractor performing the Work of this Section may demonstrate compliance with the above qualification requirements by demonstrating that it is certified or authorized as an installer by a manufacturer designated as acceptable in these Specifications or by a manufacturer determined by the Commissioner to be an approved equal.
- C. A copy of such manufacturer certification or authorizations must be submitted, or verified in writing by the manufacturer.

1.06 QUALITY ASSURANCE

- A. All materials furnished shall be new and unused and free from defects. All materials shall meet all applicable codes provided a standard has been established for the material in question.
- B. All products and materials to be clean, free of manufacturers defects, and free of damage and corrosion.
- C. Procure and pay for all necessary permits, licenses, inspections, and observe any requirements stipulated therein.
- D. Adhere to all Quality Assurance items in the Sub-Contract Agreement issued by the Construction Manager.
- E. All products shall be Y2K compliant. The contractors shall provide a statement compliance letter for all products covered under this contract.

1.07 SUBMITTALS

- A. Submit within five working (5) days of notice to proceed the following items in accordance with the Contract Documents:
 1. Product Data
 - a. Three (3) sets of original manufacturer's product data sheets for all material and equipment proposed for use on this project. Only specified or accepted manufacturers or suppliers shall appear in the product data submittal.
 - b. Where product data sheets contain information on multiple products or product configurations, the specific item being submitted for approval shall be clearly marked.

2. Shop Drawings

- a. Two (2) reproducible vellum plot sets and three (3) blue line copies of each drawing (bound) showing:
 - 1) Point-to-point wiring diagrams including the terminal connections and cross connections for all security devices, security panels, power supplies, cameras and console monitoring equipment. The diagram shall indicate the number of conductors, color code and wiring labels. All wiring splices and equipment grounding shall be shown on the point to point wiring diagram.
 - 2) Drawings must show evidence of coordination with other trades.
3. Individual submissions shall be provided for each specific material, system or equipment as identified herein. Submittals provided other than in this manner shall be returned without review.
4. All product data and drawings shall be submitted sufficiently in advance of field requirements to allow ample time for review and re-submittal as may be required. All submittals shall be complete and contain all required and detailed information.
5. Acceptance of any submittal data or shop drawing shall not relieve the contractor from responsibility for errors, omissions or inadequacies of any sort.
6. Each product data submittal shall contain the contractors name, project number, project title and specific reference to the applicable drawing and specification section.

B. As-Built Documents

1. During construction, the contractor shall keep an accurate record of all deviations between the work as shown on the drawings and that which is accurately installed.
2. Upon completion of work and acceptance by Library/Engineer, provide As-Built drawings of the complete system including, but not limited to, the following:
 - a. Scaled floor plans of each floor showing the exact location of each security device, equipment room details (elevation of all walls), showing the exact placement of all cabinets, racks, blocks, etc. and a riser diagram showing all security devices, panels, and cabling. Include details showing the exact type, quantity and route of all security system cables. The size and location of all security conduit, conduit sleeves, junction boxes and cabling splices.
 - b. Scaled installation details showing each typical installation configuration including door elevations indicating the exact placement of all security devices.
 - c. As-built drawings shall be provided in both reproducible hard-copy (Vellum) and machine readable (AutoCAD V.2004) format.
 - d. Provide the Library/Engineer with two (2) sets of Operation and Maintenance Manuals including:
 - e. Reduced-size (minimum 11" x 17") prints of all as-built drawings as described above.
 - f. Copies of all shop drawings.
 - g. Manufacturers original cut sheets for each component provided under this work.

- h. Manuals shall be provided in a high quality, 3-ring binder and completely indexed. Submit manuals to the Owner not more than 2 weeks after project completion.
3. Owner's Manuals
- a. General
 - 1) Submit 2 draft copies of owner's manuals for review. After review by authorized representative, the contractor shall incorporate review comments and submit 6 final copies.
 - 2) Update manuals with modifications made to system during guarantee period. Provide replacement pages or supplements in quantity stated above.
 - 3) Assemble owner's manuals into multi-volume sets as necessary and required by the Owner.
 - 4) Protect each volume with a heavy duty vinyl plastic binder. Volumes to have plastic printed dividers between major sections and have oversized binders to accommodate additional information.
 - 5) Each binder to be silk screened with project name and volume title on front cover and binder.
 - 6) On the first page of each manual identify with project name, manual title, owner's name, engineer's name, contractor's name, address and service phone number, and person who prepared manual.
 - b. Operating manual to serve as training and reference manual for all aspects of day-to-day operation of the system. As a minimum include the following:
 - 1) Sequence of operation for on-line and off-line operating modes. The sequences shall cross-reference the system point names.
 - 2) System manufacturer's complete operating manuals.
 - c. Provide maintenance manual to serve as training and reference manual for all aspects of day-to-day maintenance and major system repairs. As a minimum include the following:
 - 1) Complete as-built installation drawings for each system.
 - 2) Overall system electrical power supply scheme indicating source of electrical power for each system component. Indicate which components are on emergency power and indicate all battery backup provisions.
 - 3) Overall system shielding and grounding scheme indicating all major components and ground paths.
 - 4) Photographs and drawings showing installation details and locations of equipment.
 - 5) Routine preventive maintenance procedures, corrective diagnostic troubleshooting procedures, and calibration procedures.
 - 6) Parts lists with manufacturer's catalog numbers and ordering information.

- 7) Lists of ordinary and special tools, operating materials supplies and test equipment recommended for operation and servicing.
 - 8) Manufacturer's operating set up, maintenance and catalog literature for each piece of equipment.
 - 9) Maintenance and repair instructions.
 - 10) Recommended spare parts.
 - 11) Field test reports.
- d. Provide Programming Manual to serve as training and reference manual for all aspects of system programming. As a minimum include the following:
- 1) Complete programming manuals, and reference guides.
 - 2) Details of any special software packages supplied with system.
 - 3) Information required for independent programming of system.
 - 4) Point schedule.
 - 5) Software troubleshooting procedures.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials: Deliver materials (except bulk materials) in manufacturer's unopened container, fully identified with manufacturer's name, trade name, type, class, grade, size and color.
- B. Storage of Materials, Equipment and Fixtures: Store materials suitably sheltered from the elements, but readily accessible for inspection until installed. Store all items subject to moisture damage in dry, heated spaces. Provide space requirements for storage in submittals list. Storage space shall be assigned by the General Contractor.
- C. Store all materials in a secure fashion to prevent the loss of these materials due to pilferage or theft.

1.09 COORDINATION OF THE WORK

- A. Certain materials to be installed under this Contract may be supplied by the Owner. Examine the Contract Documents to ascertain these items.
- B. Carefully check space requirements and the physical confines of the area of work to insure that all material can be installed in the spaces allotted thereto.
- C. Transmit to other trades in a timely manner all information required for work to be provided under their respective Sections in ample time for installation.
- D. Wherever work interconnects with or contacts the work of other trades, coordinate with other trades to insure that all trades have the information necessary so that they may properly install all the necessary connections and equipment
- E. Due to the type of installation, a fixed sequence of operation is required to properly install the complete systems. Coordinate project and schedule work with the General Contractor in accordance with the construction sequence. Provide progress status of the installation to the General Contractor to allow them to update their project schedules.
- F. Attend all construction meetings, at the project site or at other location, as requested by the Owner or General Contractor.

- G. When directed by the Owner, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper compliance with the design intent.

1.10 CODES, REGULATIONS AND STANDARDS

- A. The installation shall be in compliance with the requirements of the National Electrical Code, OSHA, recommendations and the rules, regulations and requirements of Federal Communications Commission.
- B. The installation shall comply fully with all county, city, and state laws and ordinances, regulations and codes applicable to the installation.
- C. Local electrical and building codes may be differ with national codes. Follow the most stringent code or recommendations. Where there are instances of ambiguity, refer to the Engineer for interpretation.
- D. All equipment shall be equal to or exceed the minimum requirements of NEMA, IEEE, ASME, ANSI and Underwriters' Laboratories.
- E. Should any change in plans or specifications be required to comply with governmental regulations, the contractor shall notify the Owner at the time of submitting this bid.
- F. The installation shall conform to the latest safety codes and regulations. Where conflicts exist, the most stringent code or regulation shall apply.

1.11 WARRANTY

- A. Provide a warranty in accordance with the Contract Documents.
- B. All work and all items of equipment and materials shall be warranted for a minimum period of one year from the date of acceptance of the work.
- C. Within 24 hours after notification, correct any deficiencies that occur during the guarantee period at no additional cost to the City of NY, to the satisfaction of the City of NY and Engineer. Obtain similar guarantees from subcontractors, manufacturers, suppliers and sub-trade specialists.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Where specific items are called out in the specification or indicated on the drawings for a specific application, use those products or materials. Otherwise use first class products and materials that have been approved by the Library/Engineer.
- B. Part numbers provided in this section have been coordinated with the latest manufacturers product literature, and are accurate at the time of writing. They are, however, subject to change by the manufacturers at any time. If a specific part number is invalid, provide product meeting component description.

2.02 COMPONENT SPECIFICATION

- A. Base bid manufacturers: Subject to compliance with technical requirements of these specifications, the contractor may provide cable and equipment, as noted, from the manufacturers listed below:
 - 1. Coax and Paired Copper Cables
 - a. Windy City Wire

- b. West Penn Wire
- c. Belden
- d. CommScope, Inc.
- e. Intrusion Alarm devices and panels
 - 1) Gemini
 - 2) Bosch
 - 3) UTC/GE Interlogix

2. CCTV

- a. Cameras
 - 1) Pelco
- b. Digital Video Recorder
 - 1) Pelco
- c. Monitors
 - 1) Nothern Video
 - 2) American Dynamics
 - 3) Everfocus

3. Power Supplies

- a. Pelco
- b. Altronix

B. Wire and Cables

- 1. Wire and cable shall be rated for use in return air plenum. Wire and cable shall be compliant with equipment manufacturers specifications. The size of the wire and cable shall be adjusted in accordance with lengths of run and the manufacturers specifications.
- 2. Plenum (3) Shielded Twisted Pair Cable
 - a. 3 pairs, individually shielded with common 24 AWG (7x32) drain wire, stranded, insulated 22 AWG (7x30) tinned copper conductors. Each conductor Individually Teflon insulated. Overall plenum rated (CMP) jacket.
 - b. Manufacturer: West Penn Wire Part No.: D25431 Or approved equal.
- 3. Plenum (1) Unshielded Twisted Pair Cable
 - a. 1 pair, individually unshielded stranded, insulated 18 AWG (7x26) tinned copper conductors. Each conductor individually Teflon insulated. Overall plenum rated (CMP) jacket.
 - b. Manufacturer: West Penn Wire. Part No.: 50224 Or approved equal
- 4. Plenum (1) Unshielded Twisted Pair Cable

- a. 1 pair, individually unshielded stranded, insulated 22 AWG (7x30) tinned copper conductors. Each conductor individually Teflon insulated. Overall plenum rated (CMP) jacket.
- b. Manufacturer: West Penn Wire. Part No.: 50221 Or approved equal
- 5. Plenum (2) Conductor Cable
 - a. 2 conductor ASTM bare copper, 18 AWG. Each conductor individually copolymer insulated. Overall plenum rated (CMP) jacket.
 - b. Manufacturer: West Penn Wire. Part No.: 506970 Or Approved Equal
- 6. Plenum (4) Conductor Cable
 - a. 4-conductor stranded, individually insulated 22 AWG (7x30) tinned copper conductors. Each conductor individually Teflon insulated. Overall plenum rated (CMP) jacket.
 - b. Manufacturer: West Penn Wire. Part No.: 50241 Or Approved Equal
- 7. Plenum RG59/U Coaxial Cable
 - a. Single, solid, 20 AWG solid copper center conductor. Foamed FEP with tape barrier. Copper braid; 95% copper braid 95% shield coverage. Overall plenum rated (CMP) outer sheath.
 - b. Electrical characteristics: Nominal DC Resistance: 6.5 ohms/1000'. Nominal Attenuation: .85 db/100' @ 10 MHZ. 82% velocity of propagation.
 - c. Manufacturer: West Penn Wire. Part No.: 25815 Or Approved Equal

C. Power Supplies

- 1. Intrusion Detection/Device Power Supply
 - a. The unit shall meet the following specifications:
 - (1) 120 VAC input voltage; 3A maximum current draw.
 - (2) 12 or 24 VDC switch selectable, regulated and filtered output; short circuit protection with auto reset.
 - (3) Self-contained unit with a lockable steel NEMA 1 enclosure.
 - (4) The power supply shall include back-up batteries with 90 minutes run time.
 - b. Manufacturer: Altronix Part No.: AL400UL Or approved equal
- 2. CCTV Power Supply
 - a. The unit shall be UL listed CCTV power supply.
 - b. The power supply shall provide 24VAC or 28VAC distributed via sixteen (16) fuse protected outputs for powering CCTV cameras, heaters and other video accessories.
 - c. The power supply shall meet the following specifications:
 - (1) Input: 115VAC, 50/60Hz, 3 amp.
 - (2) Output: Sixteen (16) fuse protected outputs.

- (3) 24VAC @ 12.5 amp (300VA) supply current (0.7812 amp per device, 3.5 amp max.) or 28VAC @ 10 amp (280VA) supply current (0.625 amp per device, 3.5 amp max.).
- (4) Outputs are rated @ 3.5 amp.
- (5) Surge suppression.
- (6) Electrical:
 - (a) Operating temperature: 0° C to 49° C ambient.
 - (b) 153.55 or 143.31 BTU/Hr.
 - (c) System AC input VA requirement: 345VA.

d. Features:

- (1) Sixteen (16) power LEDs.
- (2) Illuminated master power disconnect circuit breaker with manual reset.
- (3) 3-wire grounded line cord.
- (4) Removable terminal blocks with locking screw flange.
- (5) Spare fuses shall be provided.

e. Warranty - Lifetime Warranty

f. Manufacturer: Altronix. Part No.R2416300UL or approved equal

3. UPS

a. The unit shall be a Smart-UPS,1000 Watts /1440 VA, Input 120V /Output 120V, Interface Port SmartSlot, USB, Rack Height 2 U

b. The UPS shall meet the following specifications:

(1) Output

- (a) Output Power Capacity - 1000 Watts / 1440 VA
- (b) Max Configurable Power - 1000 Watts / 1440 VA
- (c) Nominal Output Voltage - 120V
- (d) Output Voltage Distortion - Less than 5%
- (e) Output Frequency (sync to mains) - 50/60Hz +/- 3 Hz
- (f) Topology - Line Interactive
- (g) Waveform Type - Sine wave
- (h) Output Connections - (6) NEMA 5-15R NEMA 5-15R

(2) Input

- (a) Nominal Input Voltage - 120V
- (b) Input Frequency - 50/60 Hz +/- 3 Hz (auto sensing)
- (c) Input Connections - NEMA 5-15P NEMA 5-15P
- (d) Cord Length - 8 feet (2.44 meters)
- (e) Input voltage range for main operations - 82 - 144V
- (f) Input voltage adjustable range for mains operation - 75 - 154V

(3) Batteries & Runtime

- (a) Battery Type - Maintenance-free sealed Lead-Acid battery with suspended electrolyte : leakproof

- (b) Typical recharge time - 3 hour(s)
- (4) Communications & Management
 - (a) Interface Port(s) - SmartSlot, USB
 - (b) Available SmartSlot™ Interface Quantity 1
- (5) Control panel - Multi-function LCD status and control console
- (6) Audible Alar - Alarm when on battery : distinctive low battery alarm : configurable delays
- (7) Emergency Power Off (EPO) - Optional
- (8) Surge Protection and Filtering
 - (a) Surge energy rating - 459 Joules
 - (b) Filtering - Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : meets UL 1449
- (9) Physical
 - (a) Maximum Height - 3.50 inches (89 mm)
 - (b) Maximum Width - 17.00 inches (432 mm)
 - (c) Maximum Depth - 18.00 inches (457 mm)
 - (d) Rack Height - 2U
 - (e) Net Weight - 63.00 lbs. (28.64 kg)
 - (f) Environmental
 - (g) Operating Environment - 32 - 104 °F (0 - 40 °C)
 - (h) Operating Relative Humidity - 0 - 95%
 - (i) Online Thermal Dissipation - 90.00 BTU/hr
- (10) Conformance
 - (a) Regulatory Approvals - CSA, ENERGY STAR (USA), FCC Part 15 Class A, UL 1778
 - (b) Standard Warranty - 3 years repair or replace (excluding battery) and 2 year for battery
 - (c) Equipment protection policy - Lifetime : \$150000
 - (d) RoHS - Compliant

c. Manufacturer: APC. Model SMT1500RM2U or approved equal

F Door Contacts

1. Hermetically sealed reed switch type contact, flush mount and designed for use in steel doors. Minimum gap shall be 3/4" in steel. Coordinate color with Commissioner /City of New York.
2. Manufacturer: GE Interlogic. Part No.: 1076C or Approved Equal

G Surface Mounted Door Contacts

1. The unit shall feature a high strength extruded aluminum housing and completely encapsulated in polyurethane potting compound.
2. The unit shall include SPDT contacts rated at 30 V AC/DC, 0.25 Amp, 7.5 W.
3. The unit shall include armored cable

4. Manufacturer: GE Security. Part No. 2505A or approved equal.

E Glassbreak Sensor (not required)

1. The unit shall be a shock glassbreak dual technology sensor that recognizes exact frequency patterns generated by protected glass is broking and impact.
2. The unit shall be rated for all types of glass including plate, laminated, tempered and wired.
3. The unit shall feature consistent detection even of soft, quiet glass breaks.
4. The unit shall be powered by external power supply.
5. Electrical requirements: 10-14 VDC, 25 mA current at 12 VDC.
6. The alarm response shall be 4 seconds.
7. The housing materials shall be ABS plastic.
8. The unit dimensions shall be 2.25"H x 4/5"W x 4.5"L, color shall be white.
9. Environmental requirements shall be: operating temperature -4F to 131F, relative humidity 10-95% non-condensing.
10. Manufacturer: Honeywell. Model FG-730 or approved equal.

F Motion Sensor (wall/column mounted)

1. The unit shall be a passive infrared detector with adaptive 4D signal processing.
2. The unit shall be UL listed device.
3. The unit shall be able to analyze size, speed, shape of the objects.
4. The unit shall utilize true (seven) curtain "barrier" coverage patterns.
5. The mounting height shall be 6-10 feet.
6. The unit shall have 50 feet coverage range.
7. The unit shall include Form C relay. Contacts rate shall be 0.1A at 28 VDC
8. Input voltage – 10-15 VDC, 9 mA
9. Temper contacts shall be rated 100mA at 28 VDC.
10. Dimensions shall be 4"H x 2.8"W x 2"D.
11. The unit shall include swivel bracket.
12. Manufacturer – GE Interlogix. Part No. AP750 or approved equal.

G Motion Sensor (ceiling mounted)

1. The unit shall be ceiling mount, low profile panoramic PIR Detector
2. The unit shall use alternate polarity pulse count.
3. It also shall use a pointable Fresnel lens to provide up to 7.5 m (24 ft) of coverage.
4. The unit shall be mounted on the surface, or semi-flush directly to a ceiling or a standard octagonal electrical box
5. The sensitivity shall be field selectable for standard, intermediate or high.
6. Manufacturer – Bosch Security. Model No. DS936 or approved equal.

H Alarm Panel

1. The unit shall be a digital alarm control communicator designed to transmit a digital signal through telephone line.
2. The unit shall be listed by UL for NFPA 72 applications, Central Station, Local, Police Connect, Bank Safe and Vault, Mercantile Safe and vault and Grade A Household.

3. The unit shall support initiating and indicating modules and command centers.
4. The alarm panel shall support the following communications:
 - a. Operating temperature: 0-49°C (32-120°F)
 - b. Input power: 16.5Vac via class 2 plug-in 40VA transformer, supplied
 - c. Loop voltage: 10-13VAC
 - d. Loop current: 2.5mA with 2.2ohm end-of-line resistor (model EOL2.2K); 5mA for 2-wire smoke detector zones
 - e. Loop resistance: 300W max.; 50W for 2-wire smoke detector zones
 - f. Relay outputs (burglary; reset; aux): wet, 12Vdc, 1.2A max.; Dry (cut related jumper for dry contacts), SPDT contacts 24Vdc, 2A, 0:6 PF
 - g. Auxiliary power output: 12Vdc regulated
 - h. Remote power output: 12Vdc regulated (for keypads)
 - i. 750 mA combined standby current (remote power + aux. power + reset relay power)
 - j. Standby time: residential fire/burglary & commercial burglary, 4 hours minimum
 - k. EZM module: GEM-EZM8: input, 50mA (including PGM output)
 - l. PGM output: 5mA, 12V special application
 - m. Keypad current: GEM-RP1CAE2: 100mA; 35mA if back lighting is disabled (cut W1, W2 & W3) PGM output: 5mA, 12V special
 - n. Application
 - (1) Maximum number of keypads: 15 maximum wiring length for each run (#22AWG): 1000' divided by total number of keypads & EZMs on run
 - (2) Keypad dimensions: 4 3/8" x 5 7/8" x 1 1/6" (HWD); 11.1cm x 14.9cm x 2.7cm (HWD)
5. Manufacturer: Gemini. Part No. P9600 (96 zones with zone expansion modules), GEM-EZM8 (8-zone expansion module), GEMK2AS (keypad) or approved equal.

I Equipment Cabinet

1. The unit shall be a pivoting, sectional wall equipment cabinet.
2. The contractor shall supply a system of vertical racks capable of supporting specified electronics.
3. The cabinets shall be capable of being configured in a variety of heights, either as a single unit or as a series of connected units.
4. Side components shall offer ventilation. The bottom shall be open with closure panel available.
5. Rack rails shall be punched and adjustable with a lacing bar.
6. Model options shall include those that are welded and shipped as an assembled unit.
7. The rack shall be of a modular pre-engineered construction
8. All components within the system shall be:
 - a. Of pre-engineered construction, ie: constructed from a series of independent components.
 - b. Available from a pre-defined manufacturers component model number representing a complete starter and/or add-on cabinet.

- c. In common production for at least two years prior to the date of submission.
 - d. Free from alterations to the installed cabinet or series of cabinets, will be accomplished without the need for either welding or carpentry work.
 - e. Capable of cables or conduits passing through the entire width of a series of connected vertical cabinets without obstruction.
 - f. Capable of supporting E.I.A. standard 19" (483mm) width rack mounted equipment.
 - g. Constructed of 16 gauge skins with 1/8" thick laser cut corner braces.
 - h. Of standard vented or solid blank panel and shall be determined by the contractor and included to cover areas not filled in with specified equipment. These panels shall be measured in standard rack unit multiples and available with standard part numbers for future changes to the system.
9. Optional Accessories
- a. A full range of accessories shall be provided:
 - (1) Electrical outlet supply, shelf support brackets, stationary shelves, pullout shelves, blowers and cooling fans, corner fillers and spacers.
10. Mounting Hardware
- a. Mounting hardware for the specified electronics shall be available upon request. Panel bolts, washers and clips with captive nuts suitable for use with E.I.A. standard punched rack rails shall be included.
 - b. Slide kits where appropriate (including drawers) shall be of ball bearing operation. Friction or roller type slides are not acceptable.
11. The size of the rack shall be 28"H x 22-1/8"W x 26"D. The mounting space shall be 78-3/4" (45 RU).
12. Manufacturer: Middle Atlantic. Model DWR-12-26 (equipment cabinet), contractor to specify all required accessories, or approved equal

2.03 CCTV

A. IP VIDEO MANAGEMENT SYSTEM

- 1. The IP video management system shall consist of software operating on an optimized hardware platform. The NVs software shall consist of base software with individual, non-expiring licenses in the required quantity.
- 2. The IP video management system software updates shall be downloadable from a publicly available website.
- 3. The IP video management system shall support up to 128 combined IP and analog video streams, with up to 64 direct-attached analog cameras. Analog streams shall be supported using Pelco and/or third-party encoders.
- 4. The IP video management system shall provide 350 Mbps for RAID5, 300 Mbps for JBOD systems throughput for recording of analog and IP video streams, playback and export.
- 5. The IP video management system shall have a SSD system drive to increase responsiveness.
- 6. The IP video management system shall support recording of JPEG, MPEG-4 and H.264 IP streams.

7. The IP video management system shall support Pelco and third-party H.264 Megapixel video streams up to 10 Megapixel resolution with quantities based on a total system of 300 Mbps throughput for recording of analog and IP video streams, playback and export.
8. The IP video management system shall have a fully open architecture with support for both
9. IP-specific camera as well as cameras with ONVIF compliance.
10. The IP video management system shall support automatic detection of Pelco IP cameras. Third-party IP cameras shall be automatically detected dependent on IP driver versions and manufacturers specifications.
11. The IP video management system shall support up to 64 looping analog camera inputs with direct-attached 16-channel encoders; up to four direct-attached units. The direct-attached
12. 16-channel encoders shall support H.264 compression, CIF, 2CIF, and D1 resolutions at maximum 30ips, 16 audio inputs and RS422/485 PTZ control with Pelco P and D protocols and Coaxitron.
13. The IP video management system shall support an unlimited number of systems connected over a network. Each system shall contain two 1GB network ports; one for IP camera/encoder data, and one to connect to a network for client computer access.
14. The IP video management system shall be viewed, managed, and played back through a single user interface simultaneously with other digital video management systems through supplied Client software.
15. The IP video management system shall operate on a 4th Generation Intel® Xeon processor and 8 GB of RAM.
16. The IP video management system shall contain two DVI-D ports.
17. The IP video management system shall utilize a Windows® 7 Ultimate 64-bit operating system.
18. The IP video management system shall support and have an option for an internal DVD+/-RW.
19. The IP video management system shall allow expansion of IP video channel capacity through a licensing without any hardware modification.
20. The IP video management system shall be capable of continuous scheduled alarm/event and motion recording. Pre- and post- alarm recording shall also be available and shall be fully programmable on a per channel basis.
21. The IP video management system shall allow archival of video data to computers or SAN storage devices over a network connection with the optional DS Archive Utility. The archival schedule shall be either automatic at user-defined intervals or manual and shall be configurable per connected camera.
22. The IP video management system shall support network health and monitoring utilizing third-party SNMP monitoring tools.
23. The IP video management system shall indicate system performance and operation status utilizing a variety of HTML reports.
24. The IP video management system shall optionally support on-board video analytics in quantities of two or four channels with Active Alert software and the DS DataPoint

interface. The DS DataPoint interface shall provide video analytics monitoring including tracking and counting objects and people.

25. The IP video management system shall support Lightweight Directory Access Protocol (LDAP).
26. System Specifications
 - a. Processor - Intel® Xeon E3-1275 v3
 - b. Operating System - Windows 7 Ultimate 64-bit
 - c. Internal Memory - 8 GB DDR3 non-ECC RAM; 16GB DDR ECC RAM for DSSRV2-RD models
 - d. Network Interface - Gigabit Ethernet (1000Base-T) ports (2x)
 - e. User Interface - DS Control Point
 - f. Internal Storage (JBOD or RAID 5) - 500 GB, 4 TB, 8 TB, 12 TB, 16 TB, 20 TB, 24 TB
 - g. Raid Level - Internal RAID 5 (requires DSSRV2-RAID controller card for hot swappable drives)
 - h. External Storage - third-party SCSI targets (requires optional DSSRV-SCSI)
 - i. System Drive SSD, 4, 3.5-inch hard drive bays
 - j. Optical Drive - DVD±RW with DSSRV2-DVD
 - k. USB Ports - 3 USB 2.0 (1 front, 2 rear), 2 USB 3.0 (rear)
 - l. Power Input -100 to 240 VAC, 50/60 Hz, autoranging
 - m. Power Supply - Internal
 - n. Power Consumption - Operating Max 223 Watts, 2.03 Amp, 761.4 BTU/H
27. Video Specifications
 - a. Video System - Intel HD Graphics P4700 (shared memory)
 - b. Maximum Resolution - 3840 x 2160 per DisplayPort output (2x) 1920 x 1200 @ 60 hz on DVI-D output, 1920 x 1200 @ 60 hz on VGA output
 - c. Video Outputs - Supports up to 3 simultaneous displays using any combination of the four outputs
 - d. Video Standards - 60 Hz capable for NTSC; 75 Hz capable for PAL
 - e. Video Decoding Supported: MPEG-4 ASP; H.264 Baseline, Main, and High profiles
 - f. Decoding Performance - 16X real-time MPEG-4 streams at 704 x 480; 12X real-time H.264 Baseline profile streams at 704 x 480; 4X H.264 Baseline profile streams at 720p; 2X real-time H.264 Baseline profile streams at 1080p
28. Audio Specifications
 - a. Audio Decoding - G.711 speech codec

- b. Audio bit-rate - 64 kbps
 - c. Audio Levels
 - 1) Input - Electret microphone
 - 2) Output - Up to 3 Vp-p, adjustable, minimum load of 8 ohms
 - 3) Audio Connectors - 2, 3.5 mm stereo jacks
 - d. Audio Inputs - Microphone
 - e. Audio Outputs - Speaker or in line
29. Environmental Specifications
- a. Operating Temperature - 10° to 35°C (50° to 95°F)
 - b. Operating Humidity - 20% to 80%, noncondensing
 - c. Maximum Humidity Gradient - 10% per hour
30. Certifications
- a. CE, Class A; meets EN50130-4 standard requirements
 - b. FCC, Class A
 - c. UL/cUL Listed
 - d. C-Tick
 - e. CCC
 - f. KCC
31. Compliance, ISO/IEC 14496 standard (also known as MPEG-4)
32. Compliance, International Telecommunication Union (ITU), Recommendations G.711, "Pulse Code Modulation (PCM) of Voice Frequencies"
33. ONVIF Open Industry Forum
- B. IP Video Management Client Software requirements
- 1. The IP video management system shall provide the capability of running a client application in addition to the video management system.
 - 2. A client computer with system compatible software shall be the user interface for viewing one or more systems. Live and recorded video and current event video shall be displayed on any client computer using a proper login and password. The client computer shall be able to connect to an unlimited number of recorders simultaneously to display live and recorded video.
 - 3. Client Software shall be unlicensed and available to be installed on as many clients as required by the user.
 - 4. Client Software shall be password controlled such that password functionality set at each connected system will be recognized at the client. Password shall limit the ability to access live or recorded video as well as the ability to export video.

5. Client Software shall allow multiple monitor support for up to four displays per client workstation, providing virtual matrix functionality.
6. Client Software shall allow the connection of keyboard controllers to the client workstation to control PTZ operations and camera call-up.
7. Client Software shall allow video streams to be selectable from a system tree on an individual camera, individual system, client defined local groups, or from predefined recorder based groups.
8. Client Software shall be a tab based work environment with the ability to undock the tabs creating a virtual workspace on single or multiple monitor clients.
9. Client tabs shall include system management, live, and search options. Tabs can be displayed simultaneously on the client.
10. Systems Tab shall display and sort available systems, connection status, system names, system IP addresses, and custom categories. This tab shall additionally allow:
11. Manual connect and disconnect of systems to the client
12. Virtual systems naming
13. Auto Connecting
14. Adding, deleting, and editing available systems
15. Live video tab shall have the ability to be created up to four times on a single client workstation providing for video display combinations and simultaneous video streams from as many different systems with consideration for maximum client bandwidth.
16. Live video tab shall provide the following functionalities:
 - a. Quick Review which shall display recorded video from the last 1, 5, 15, 30, 60 or 90 minutes, providing near instantaneous review of recent events
 - b. One week graphical display of recorded video
 - c. Borderless display option
 - d. Screen layout selection
 - e. On the fly on-screen display changes including time, date, camera name, frame rate, frame size, alarm display, and border indicators
 - f. Digital zoom
 - g. User selectable in-video PTZ control or dashboard style control
 - h. Drag and drop audio support associating any audio with any video
 - i. Search video tab shall allow for the search of one or multiple cameras from one or multiple systems simultaneously. Search tab shall provide the following functionalities:
 - j. Time and date search
 - k. Advanced data search with DataPoint interfaced software to Active Alert Intelligent Video and POS
 - l. Drag and drop audio support to associate audio with any video

- m. Video authentication of exported video via check sum verification.
17. Alarm video tab shall allow for alarm pop-up and playback of active alarms. Alarms may be based on motion activity, an external software trigger from Active Alert analytics or a preset data alarm from DS DataPoint. An alarm list pane shall be displayed for playback of queued alarms.
 18. The Client shall incorporate virtual matrix functionality whereby camera sequences may be created on the monitoring workstation with the following functionalities:
 - a. Each sequence shall have a maximum of 500 cameras.
 - b. Each camera in the sequence shall have its own individual dwell time, from 1 to 60 seconds.
 - c. Each entry in a sequence shall have the capacity to trigger PTZ camera presets, patterns, or auxiliaries.
 - d. The Client shall have the capability to display recorded video with full VCR controls. This feature shall display video from multiple cameras simultaneously. The user shall be able to play video as fast as possible (all images), in real time, or by skipping a selectable number of seconds.
 - e. The Client shall support simultaneous playback of up to sixteen cameras all synchronized with each other. Non-synchronous playback of multiple cameras shall not be acceptable.
 - f. The Client shall support tours of multi-camera displays.
 19. Warranty - 3 year parts and labor
 20. Manufacturer: Pelco. Model Number: DSSRV2-080DV (NVR with optical disk drive, 8 TB storage), ENC5516 (Direct-attached analog encoder)

C. CCTV Fixed Dome Indoor Camera

1. The CCD high resolution fixed indoor dome camera shall integrate a (650 TVL) color camera and lens package into a small indoor enclosure that can be mounted directly to a ceiling or wall.
2. The CCD high resolution fixed dome camera shall feature the option of a day/night camera with an auto iris varifocal lens; IR Illumination color camera with a fixed or varifocal lens; true day/night camera with an auto iris varifocal lens; or a color camera with auto iris, electronic day/night functions, and a fixed or varifocal lens.
3. The CCD high resolution fixed indoor dome camera shall offer 24 VAC/12 VDC operation with internal synchronization.
4. The CCD high resolution fixed indoor dome camera shall provide manual 3-axis (pan/tilt/rotation) positioning.
5. The CCD high resolution fixed indoor dome camera shall provide a service connector for video output.
6. The CCD high resolution fixed indoor dome camera shall provide window blanking.
7. The CCD high resolution fixed indoor dome camera shall provide the Adaptive Motion.
8. The CCD high resolution fixed indoor dome camera shall include a removable IR cut filter.

9. The CCD high resolution fixed indoor dome camera shall include automatic white balance (AWB) capabilities.
10. The CCD high resolution fixed indoor dome camera shall meet or exceed the following design and performance specifications.
11. Camera Specifications
 - a. Image Sensor: Sony® 1/3-inch EXview HAD CCD II™ 960H
 - b. Signal Processing: Sony DSP, Effio-P
 - c. Effective Pixels
 - 1) NTSC: 976 (H) x 494 (V)
 - 2) PAL: 976 (H) x 582 (V)
 - d. Scanning Area: 6.0 (H) mm x 5.0 (V) mm (0.24 x 0.20 inch)
 - e. Scanning System
 - 1) NTSC: 525 lines; 2:1 interlace
 - 2) PAL: 625 lines; 2:1 interlace
 - f. Scanning Frequency
 - 1) NTSC: Horizontal, 15.734 kHz; Vertical, 59.94 Hz
 - 2) PAL: Horizontal, 15.625 kHz; Vertical, 50.00 Hz
 - g. Synchronization: Internal
 - h. Horizontal Resolution: 650 TVL
 - i. Lens: Varifocal
 - j. Minimum Illumination: F/1.2; 2,850°K; 30 IRE; Color (20 ms for PAL or 17 ms for NTSC); 0.13 lux; Color (500 ms) 0.03 lux; Mono (20 ms for PAL or 17 ms for NTSC) 0.05 lux; Mono (500 ms) 0.00004 lux
 - k. IR Cut Filter:: Yes, D/N switch
 - l. Dynamic Range: 120 dB Dual-scan WDR
 - m. Low-Light Technology: ICR, DSS
 - n. Shutter: Auto/Manual 1/2~1/10,000 sec; Auto 1/1.5~1/10,000 sec Manual 1/2~1/10,000 sec
 - o. Video Output: 1.0 Vp-p, NTSC/PAL composite, 75 ohms, BNC connector
 - p. White Balance: ATW/Manual/Push/Push; Lock/User1/User2/Anti CR
 - q. Signal-to-Noise Ration 48 dB(>52 dB by parameter adjustment)
 - r. Focal Length: 2.8 mm to 10.5 mm
 - s. Focus Range: ∞ to 0.3 m (1.0 ft)

- t. Horizontal Angle of View: 101.8° at 2.8 mm wide zoom; 27.4° at 10.5 mm telephoto zoom
 - u. Vertical Angle of View: 73.7° at 2.8 mm wide zoom; 20.6° at 10.5 mm telephoto zoom
 - v. Adjusting Angle
 - 1) Panning Range $\pm 180^\circ$
 - 2) Tilting Range $+90^\circ$ to 0°
 - w. Rotation Range: $\pm 180^\circ$
 - x. Noise Reduction: 3D
 - y. Motion Detection : Included (4 areas)
 - z. Privacy Zones: Included (15 sizeable windows)
 - aa. Digital Zoom: Included, 255X
 - bb. Image Stabilization: Included
 - cc. Camera Titles: Included
 - dd. Scene Learning/Analytics : Included
 - ee. Remote Access: Coaxitron and RS-485
 - ff. Alarm Out: 1
12. Electrical Specifications
- a. Power Requirement: 12 VDC $+10\%$ to -15% , 60 Hz
 - b. Power Consumption: 4.5 W
 - c. Power Connector : -pin terminal block with screw terminals
 - d. Video Connector: BNC
 - e. Alarm Output: 2-pin terminal block with screw terminals
13. Environmental Specifications
- a. Operating Temperature: -10° to 50°C (14° to 122°F)
 - b. Operating Humidity: 20% to 80%, noncondensing
14. Physical Specifications:
- a. Back Box Construction: ABS plastic
 - b. Bubble Type: Lightly obscured
 - c. Weight: 0.31 kg (0.68 lb)
15. Certifications
- a. CE, Class B
 - b. FCC, Class B

c. UL/cUL Listed

16. Warranty: 36-months, parts and labor
17. Manufacturer: Pelco. Model Numbers: FD2-DWV10-6 (True day/night, WDR, DSS, ICR Switch camera, varifocal, 2.8 to 10.5 mm lens, NTSC), FD-FK (flush mount kit), FD2-P (pendant kit) or approved equal

D. Outdoor Fixed Camera

1. The CCD high resolution environmental outdoor fixed dome camera shall integrate a (650 TVL) color camera and lens package into a small outdoor rugged enclosure that can be mounted directly to a ceiling or wall.
2. The CCD high resolution environmental outdoor fixed dome camera shall feature the option of an IR Illumination color camera with an auto iris and varifocal lens; true day/night high resolution camera with an auto iris and varifocal lens; color camera with auto iris and a varifocal lens; or day/night, wide dynamic range (WDR), low-light technology with auto iris and 2.8 to 10.5 mm or 9 to 22 mm varifocal lens.
3. The CCD high resolution environmental outdoor fixed dome camera shall offer 18 to 32 VAC/12 VDC operation with internal synchronization.
4. The CCD high resolution environmental outdoor fixed dome camera shall provide manual 3-axis (pan/tilt/rotation) positioning.
5. The CCD high resolution environmental outdoor fixed dome camera shall provide a service connector for video output.
6. The CCD high resolution environmental outdoor fixed dome camera shall provide window blanking.
7. The CCD high resolution environmental outdoor fixed dome camera shall provide the Adaptive Motion analytic to intelligently detect motion within the field of vision and trigger an alarm.
8. The CCD high resolution environmental outdoor fixed dome camera shall include a removable IR cut filter.
9. The network camera enclosure shall be environmentally rated and offer an impact resistance rating of IK10. The enclosure shall also be vandal and tamper resistant.
10. The CCD high resolution environmental outdoor fixed dome camera shall meet or exceed the following design and performance specifications.
11. Camera Specifications
 - a. Image Sensor Sony 1/3-inch EXview HAD CCD II 960H
 - b. Signal Processing Sony DSP, Effio-E
 - c. Effective Pixels
 - 1) NTSC 976 (H) x 494 (V)
 - 2) PAL 976 (H) x 582 (V)
 - d. Scanning Area - V5.58 (H) mm x 4.67 (V) mm (0.22 x 0.18 inch)
 - e. Scanning System
 - 1) NTSC 525 lines; 2.1 interlace

- 2) PAL 625 lines; 2:1 interlace
- f. Scanning Frequency
 - 1) NTSC Horizontal, 15.734 kHz; Vertical, 59.94 Hz
 - 2) PAL Horizontal, 15.625 kHz; Vertical, 50.00 Hz
- g. Synchronization Internal
- h. Horizontal Resolution 650 TVL
- i. Lens Varifocal
- j. F-Number: f/1.2
- k. Minimum Illumination f/1.2; 2,850°K; 30 IRE; Color 0.1 lux; Mono 0.0 lux
- l. IR Cut Filter: Yes, D/N switch
- m. Dynamic Range: Gamma selectable (ATR)
- n. IR Illumination Distance: 25 m
- o. IR Sensitivity: >40% at 850 nm, peak response
- p. Low-Light Technology: ICR and LEDs
- q. Electronic Shutter Range: 1/50~1/10,000 sec
- r. Video Output: 1.0 Vp-p, NTSC/PAL composite, 75 ohms, BNC connector
- s. White Balance: ATW/Manual/Push/Push Lock/User1/User4/Anti CR
- t. Signal-to-Noise Ratio: 48 dB(>52 dB by parameter adjustment)
- u. Focal Length: 2.8 mm to 10.5 mm
- v. Focus Range: ∞ to 0.3 m (1.0 ft)
- w. Horizontal Angle of View: ($97^\circ \pm 2^\circ$) at 2.8 mm wide zoom; 27° at 10.5 mm telephoto zoom
- x. Vertical Angle of View: ($70^\circ \pm 2^\circ$) at 2.8 mm wide zoom; 20° at 10.5 mm telephoto zoom
- y. Adjusting Angle
 - 1) Panning Range: $\pm 180^\circ$
- z. Tilting Range: $+60^\circ$ to 0°
- aa. Rotation Range: $\pm 180^\circ$
- bb. Noise Reduction: 2D
- cc. Motion Detection: Included (4 areas)
- dd. Privacy Zones Included (8 zones)
- ee. Camera Titles: Included
- ff. Alarm Out: 1

12. Electrical Specifications
 - a. Power Requirement
 - 1) NTSC: 18 to 32 VAC 60 Hz /12 VDC +10% to -15%
 - 2) PAL: 18 to 32 VAC 50 Hz /12 VDC +10% to -15%
 - b. Power Consumption: 4 W (IR on, without heater); 17 W (IR on, with heater on)
 - c. Power Connector: 2-pin terminal block with screw terminals
 - d. Video Connector: BNC
13. Environmental Specifications
 - a. Operating Temperature: -30° to 50°C (-22° to 122°F)
 - b. Operating Humidity: 20% to 80%, noncondensing
14. Impact Resistance: IK10
15. Physical Specifications
 - a. Back Box Construction Die-cast aluminum
 - b. Bubble Type Lightly obscured
 - c. Weight: 0.75 kg (1.61 lb)
16. Certifications
 - a. CE, Class B
 - b. FCC, Class B
 - c. UL/cUL Listed
 - d. Meets IP66 standards
17. Warranty: 36-months, parts and labor
18. Manufacturer: Pelco. Model Number: FD5-IRV10-6 (IR Illumination camera, varifocal, 2.8 to 10.5 mm lens), FD-WM (outdoor wall mount) or approved equal.

E. PTZ Camera

1. The indoor CCTV camera dome system shall be a discreet, miniature camera dome system consisting of a dome drive with a variable speed/high speed pan and tilt drive unit -inch high resolution color, CCD camera; motorized zoom lens with optical and digital zoom; auto focus; and an enclosure consisting of a back box, lower dome, and a quick-install mounting.
2. The indoor CCTV camera dome system shall meet or exceed the following design and performance specifications.
 - a. Vertical Tilt
 - b. Manual Control Speed:
second

- c. Automatic Preset Speed Pan speed 0
- d. Presets
second. For variable speed operation an appropriate controller is required.
- e. Preset Accuracy +/-
- f. Proportional Pan/Tilt Speed Continually decreases pan and tilt speeds in proportion to the depth of zoom
- g. Automatic Power-Up User-selectable to the mode of operation the dome will assume when power is cycled
- h. Zones Four zones with up to 20-character labeling for each, with ability to blank the video in the zone
- i. Motor Continuous duty, variable speed, operating at 18 to 30 VAC, 24 VAC nominal
- j. Limit Stops Programmable auto, random and frame scanning
- k. Window Blanking One programmable window blanking area
- l. Patterns One on-screen, programmable pattern including pan, tilt, zoom, and preset functions; pattern programming through control keyboard following instructions in the on-screen menu.
- m. Pattern Length One pattern of user-defined length, based on dome memory
- n. Autosensing Automatically sense and respond to protocol utilized for controlling unit whether Coaxitron or RS-422 P or D protocols; accept competitors' control protocols with the use of optional translator cards
- o. Menu System Built-in for setup of programmable functions; multilingual, including English, French, Italian, Spanish, Portuguese, and German, and alternative languages in Russian, Turkish, Polish, and Czechoslovakian
- p. Auto Flip Rotates dome 180° at bottom of tilt travel
- q. Password Protection Programmable settings with optional password protection
- r. Diagnostics On-screen diagnostic system information
- s. Display Setup User-definable locations of all labels and displays; user-selectable time duration of each display
- t. Azimuth/Elevation/Zoom On-screen display of pan and tilt locations and zoom ratio
- u. RJ45-10 Jack Pigtail Connector for UTP video, power, and data supplied
- v. BNC connector Female BNC connector for coaxial video
- w. Remote Data Port Ability to control and setup unit and to upload new operating code and language file updates through optional remote data port that is located in area with easy access. Compatible with personal computers and PDAs such as Palm and iPAQ
- x. UTP Compatibility Unit shall have an unshielded twisted pair circuit for video transmission up to 750ft

- y. Third-Party Control Systems Ability to plug in optional board that converts control signals from selected third-party controllers
 - z. Power Consumption Maximum 21 VA
3. Installation/Maintenance The unit's compact design integrates the "dome drive" and "top cap" into one comprehensive unit reducing the number of components to make installation and maintenance simple
 4. The miniature positioning system shall contain an integrated optics package (IOP) that shall meet or exceed the following design and performance specifications:
 - a. Single Format NTSC/PAL
 - b. Scanning System 2:1 interlace
 - c. Image Sensor 1/4-inch interline CCD
 - d. Effective Pixels
 - 1) NTSC 768 (H) X 494 (V)
 - 2) PAL 752 (H) X 582 (V)
 - e. Horizontal Resolution
 - 1) NTSC >470 TVL
 - 2) PAL >460 TVL
 - f. Minimum Illumination 3.0 Lux
 - g. Synchronization System AC line lock, phase adjustable via remote control, V-sync
 - h. White Balance Automatic with manual override
 - i. Shutter Speed Automatic (electronic iris)/manual – 1/60-1/30,000
 - j. Gain Control Automatic with manual override
 - k. Video Output 1.0 to 1.2 volt peak to peak, 75 ohms, adjustable
 - l. Video Signal-to-Noise >50 dB
 - m. Lens F1.8 (F=4.2-42 mm optical) 10X optical zoom, 8X digital zoom
 - n. Zoom Speed (optical range) 1.5/2.5/4.3 seconds (menu selectable)
 - o. Horizontal Angle of View 46.4° wide zoom, 5.0° telephoto zoom
 - p. Focus Automatic with manual override
 - q. Iris Control Automatic with manual override
 5. The miniature positioning system's top cap and dome drive shall be integrated into one comprehensive unit that shall meet or exceed the following design and performance specifications:
 6. Top Cap The top cap shall be manufactured from anodized cast aluminum and shall contain heat sink flanges for increased heat dissipation to allow the dome to be passively cooled

7. Materials:
 - a. Dome Drive ABS plastic
 - b. Trim and Surface Mount Rings ABS plastic
 - c. Bubble Acrylic
 - d. Finish White or black
8. Light Attenuation
 - a. Smoked 1/2 F-stop light loss
 - b. Clear Zero light loss
9. Environment Indoor
10. Operating Temperature 32°F to 122°F (0°C to 50°C)
11. Unit Weight 1.75 lbs. (0.79 kg)
12. Dimensions
 - a. With TXB 4.98" H x 6.19" W (12.85cm x 15.72cm)
 - b. Without TXB 5.13" H x 6.19" W (13.03cm x 15.72cm)
13. Certifications and Ratings
 - a. FCC, Class B
 - b. CE, Class B
14. Warranty: 36 months, parts and labor
15. Manufacturer: Pelco Part Number Indoor Positioning Dome System shall be Pelco SD423-FO (PTZ dome flush), SD423-PG-O (PTZ Dome Pendant) or approved equal

F. Monitor

1. LCD monitor shall provide high resolution, enhanced brightness, and high contrast for the sharpest video display. It shall also possess a quick response time to minimize ghosting and streaking in fast-moving scenes.
2. LCD monitor shall provide both looping composite (BNC) and S-video inputs. The monitor can be mounted on a desktop, wall, pole, or rack.
3. LCD monitor shall meet or exceed the following design and performance specifications.
4. Input Voltage: 100-240 VAC, 50/60 Hz, internal power supply or 12 VDC external power supply (not included)
5. Power Consumption: 32 W maximum
6. Input Interfaces
 - a. VGA (x1)/HDMI (x1)
 - b. Composite: 2, BNC in/out

- c. Audio: PC Audio (x1)
- 7. Sync Format: NTSC/PAL, autosensing
- 8. Environmental Specifications
 - a. Operating Temperature: 32° to 104°F (0° to 40° C)
 - b. Storage Temperature: -4° to 140°F (-20° to 60°C)
 - c. Operating Humidity: 10% to 85%, noncondensing
- 9. General Specifications
 - a. Panel Resolution
 - 1) 1280x1024 SXGA (maximum),
 - 2) Panel Aspect Ratio: 4:3
 - b. Front Panel Controls: Video input, menu (up, down, left, right), power, front panel lockout
 - c. Indicators: LED (power on, standby, sleep), on-screen ("no signal")
 - d. WARRANTY 1 year, parts and labor
- 10. Manufacturer: Northern Video. Model Number: LCD 19HDMI or approved equal

PART 3 -- EXECUTION

3.01 LOCATION OF EQUIPMENT

- A. The drawings and specifications describe approximate locations of the work. Verify all locations in the field.
- B. Locate equipment and accessories so as to provide easy access for proper service and maintenance.

3.02 INSTALLATION OF CABLING

- A. Run all wiring in compliance with the requirements of the electrical specification (Division 16) and in accordance with authorities and codes having jurisdiction. Provide separate conduit for control wiring under this Section.
- B. Cabling shall be bundled separately from other system cabling. Each cable bundle shall be tie wrapped and supported J - hooks every five feet.
- C. Cables running parallel to electrical cables/conduits shall be separated by a minimum of 12". Maintain at least 18" separation from all lighting ballasts and fixtures.
- D. Cables which must cross electrical cables/conduits shall do so only at 90 degree angles.

3.03 INSTALLATION OF SECURITY EQUIPMENT PANELS

- A. Panels shall not be located directly underneath valves or other areas where they may be subject to water or heat damage. In addition, panels shall be mounted with the bottom no lower than 3 feet and the top no higher than 7 feet above the floor, with a minimum of 3 foot clearance at the front.
- B. Follow manufacturers' instructions for installing, connecting, and adjusting all equipment and cabling.

- C. Submit three (3) copies of such instructions to Owner before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Where no instructions are included with the equipment, follow accepted industry practices.
- D. The locations of equipment, power outlets, boxes, etc. indicated on the drawings are approximately correct and are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed.
- E. Exercise particular caution with reference to the location of all field devices that they have precise and definite locations accepted by the Owner/Architect before proceeding with the installation.
- F. The Contractor shall maintain a current copy of this bid specification at the job site at all times.
- G. The Contractor shall maintain a complete file of shop drawings and other submissions at the job site at all times. These shop drawings and submissions shall be made available to the Owner at his request.
- H. Keep all items protected before and after installation, with dust and moisture proof barrier materials. It shall be the contractor's responsibility to ensure the integrity of these protective measures throughout the life of the project.
- I. Ensure that safe ingress and egress from all work sites is maintained during movement and installation of materials.
- J. Clean up all debris generated by installation activities. Keep all work areas free of debris at all times.
- K. Perform all tests required by local authorities in addition to tests specified herein.
- L. At all times during the construction, the Contractor shall protect all equipment from damage and theft. Equipment in the equipment room shall not be installed until such time as other trades have completed their work in that area so that the equipment will not be moved or damaged.
- M. Upon project completion, provide as-built drawings and documentation as defined herein.

3.04 IDENTIFICATION

- A. Furnish a nameplate for each security equipment panel, NEMA and power supply enclosures provided under this work. Plates shall be 2 1/4" lamacoid or aluminum with a black enamel background with etched or engraved upper case 1/4" white letters, or black and white laminated bakelite plate with beveled edges. Coordinate labeling and nameplate requirements with the Owner/Engineer prior to installation. Nameplates shall be screwed on with countersunk screws.
- B. All cables and terminal strips shall be labeled with machine generated black uppercase lettering on a permanent adhesive label stock, covered with a permanent water resistant sealer. Labels shall be placed on both ends of the cable and no more than 6" from the point at which the cable is broken out into individual copper pairs or from the connector or terminal block. All labels shall be readily visible. Coordinate labeling requirements with Engineer/Owner.
- C. Hand lettered label stock shall not be accepted for final installation. Hand lettered stock is only acceptable for use with temporary labeling required during construction phases.
- D. If at any time during the project, the cable label becomes illegible or removed, the Contractor shall immediately replace it with a duplicate pre-printed cable label.
- E. All cable IDs shall be both physically and visually accessible upon completion of the project.

3.05 FIRE STOP PENETRATION SEALANT

- A. Provide fire-resistant materials of a type and composition necessary to restore fire ratings to all wall or floor or ceiling penetrations. Material must be properly classified and meet national and local codes.
- B. All penetrations through fire rated floors and walls shall be sealed to prevent the passage of cold smoke, fire, toxic gas or water through the penetration either before, during or after a fire. The fire rating of the penetration seal shall be at least that of the floor or wall into which it is installed, so that the original fire rating of the floor or wall is maintained as required by Article 300-21 of the National Electrical Code.
- C. No flammable material may be used to line the chase or hole in which the fire stop material is to be installed.
- D. When damming materials are to be left in place after the seal is complete, then all such materials shall be non-flammable.
- E. The sealant shall remain resilient and pliable to allow the removal and/or addition of cable without the necessity of drilling holes. It shall adhere to itself perfectly to allow any and all repairs to be made with the same material. It shall allow for vibration, expansion and/or contraction of anything passing through the penetration without affecting the seal, or cracking, crumbling and spalling.
- F. When sealant is injected into a penetration, the material shall expand to surround all the items within the penetration and maintain pressure against the walls of the penetration as well as the pass-through items. The material shall cure within five minutes. No heat shall be required to further expand the material to prevent the passage of fire and smoke or water.
- G. The materials shall have been subjected to fire exposure in accordance with standard time-temperature curve in the Standard, UL, ASTM E 119 and NFPA 251. The fire stop material shall have also been subjected to the hose stream test in accordance with UL 10B.

3.06 STAFFING

- A. The Contractor shall keep a qualified foreman in charge of the work at all times. The foreman shall be present in the field at all times during the performance of the work. Such foreman shall be replaced if deemed to be unsatisfactory by the Owner.
- B. The Contractor shall designate in writing to the Owner that the full time foreman shall serve as a contact for resolution of problems, job coordination, additions, changes, etc. The Contractor's foreman shall have full authority to represent the Contractor in making decisions and executing the work in an acceptable manner.
- C. The Contractor shall provide a supervisory work force sufficient to efficiently execute the Contractor's responsibilities.
- D. The Contractor shall provide the level of staffing necessary to meet all construction schedules.
- E. The Contractor shall use only skilled, experienced and reliable workers and shall discontinue the services of anyone employed on this project upon written request of the Owner.
- F. The contractor shall be qualified to perform the work activities and be knowledgeable of the following:
 - a. Installation of intrusion detection systems.
 - b. Installation of access control systems.
 - c. Testing of cables and conductors for electrical continuity.
 - d. Testing conductor insulation.

- e. Termination, connectorization, and testing of specified twisted pair cables.
- G. Manufacturers printed installation instructions will be used for in-process quality control and final acceptance of the work installation.
- H. The contractor personnel will be required to provide and use the proper tools and test equipment in the performance of each activity. Tools must be in good working order and test equipment must be properly calibrated. Contractor is responsible for safe storage of tools, and is responsible for their security.

3.07 DEMONSTRATION

- A. The Contractor shall furnish the services of competent instructors who will give instruction in the adjustment, operation and maintenance, including pertinent safety requirements, of the equipment and system specified. The training shall be oriented toward the system installed rather than being a general training course. Each instructor shall be thoroughly familiar with all aspects of the subject matter they are to teach. All equipment and material required for classroom training shall be provided by the Contractor.
- B. The training program shall be accomplished in two phases for the time interval specified for each phase.
- C. The first phase shall be given prior to the acceptance test period at a time mutually agreeable between the Contractor and the Owner, and shall be at least five (5) days (8 hours/day) in length. Operating personnel to be trained in the functional operations of the security system installed and the procedures that the operators will employ for system operation. The training shall include but not be limited to:
 - a. General Security Systems Configuration
 - b. Operation of Computer and Peripherals
 - c. Report Generation
 - d. Operator Control Functions
 - e. Graphics Generation
 - f. General equipment layout
 - g. Troubleshooting procedures
 - h. Preventive Maintenance procedures
- D. The second phase shall be conducted after system acceptance testing for a period of three (3) days. The training shall include but not be limited to:
 - a. Programming
 - b. Data Base Generation
 - c. Supervisory Level Operator Commands
 - d. Topics requested by Owner.

3.08 COMMISSIONING

- A. Perform a three-phase commissioning procedure consisting of field I/O calibration and commissioning, system commissioning and integrated system program commissioning. Document all commissioning information on commissioning data sheets, which shall be submitted prior to acceptance testing. Notify the Owner in writing of the testing schedule so that operating personnel may observe calibration and commissioning.
- B. System Program Commissioning
- C. Integrated System Commissioning

3.09 INSPECTIONS AND CABLE TESTING

- A. After the installation is complete, in addition to any other required testing as described herein, and at such times as the Owner directs, the Contractor shall be present while the Owner conducts an operating test for approval. The installation shall be demonstrated to be in accordance with the requirements of this specification. Any defects revealed shall be corrected promptly at the Contractor's expense and the tests performed again.
- B. As a minimum, the Contractor shall test, as described below, all cables installed under these specifications.
 - a. Post installation testing
 - b. Conduct cable testing as described below upon completion of installation. Test fully completed systems only.
 - c. Multi-conductor metallic cables: End-to-end testing of each cable pair/conductor for continuity, ground fault, proper termination, shorts and crossed pairs.
- C. If a bad conductor is found, replace the entire cable. Remove any cables that contain a defective conductor from ceiling and/or floor duct. Do not abandon defective cables in place.
- D. The Owner reserves the right to observe of any or all portions of the testing process.
- E. The Owner further reserves the right to conduct, using contractor equipment and labor, a random re-test of 10% of the cables to confirm documented test results. Such retests may be observed and reported on by a third party contractor retained by the Owner.
- F. All test results and corrective procedures are to be documented and submitted to the Owner within five (5) working days of test completion.

3.10 ACCEPTANCE TESTING

- A. Submit a detailed acceptance test procedure designed to demonstrate compliance with contract requirements at least 4 weeks before the start of testing. This procedure to be approved prior to the start of the testing.
- B. During acceptance testing provide services of a fully qualified security systems technician who is knowledgeable of the project.
- C. Using the commissioning test data the Owner and/or his representative shall select, at random, functions to be demonstrated. These functions shall be demonstrated by the Contractor in accordance with the acceptance test procedure. At least 15 percent of the systems functions shall be demonstrated. At least 95% of the functions demonstrated must perform as specified and documented on commissioning data sheets or the system must be retested.
- D. Furnish instruments required for testing. Submit catalog data on all instruments for approval prior to performance of tests.

- E. After the acceptance tests are complete and the system is demonstrated to be functioning as specified, a thirty-day endurance test period shall begin. If the system functions as specified throughout the endurance test period requiring only routine maintenance and adjustment, the system shall be accepted. If during the endurance test period the system fails to perform as specified and cannot be corrected within eight hours, the Owner may request that the endurance tests be repeated after problems have been corrected.

END OF SECTION 16800

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Department of
Design and
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**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

Renovation of the Rugby Branch Library Re-Bid

**LOCATION: 1000 Utica Avenue
BOROUGH: Brooklyn 11203
CITY OF NEW YORK**

Contractor _____

Dated _____, 20____

Entered in the Comptroller's Office _____

First Assistant Bookkeeper _____

Dated _____, 20____

