

Addendum No. 1

RFP for Health Care Center No. 10, Interior Improvements and Additions

Project No. 14-18-4745-01

2230 Cottman Avenue, Philadelphia, PA 19149

January 9, 2020

1. Questions from Applicants (in alphabetical order) and Answers.

From: Pannulla Construction, Inc. on January 8, 2020:

Q1. Of the (6) sets of drawings, I only found door schedules on “East & West Additions” & “Exam Rooms 107-120..”. Can you confirm that there are no other doors, frames, or hardware needed on the other plans?

A1. *For the Ornamental Fence, two (2) doors with panic hardware and locks are required on the north (Cottman Ave) side, and two (2) swing gates with lockable latches are required on the south (parking lot) side. No doors, frames, or hardware are required for the Walk-In & Triage Exam Rooms or Restroom Improvements.*

Q2. “East & West” drawings have a note next to the door schedule referring to the hardware schedule being in a architectural addendum. There is no division 8 spec in any of the (4) tech manuals and I don’t see an addendum. Can you please see if there was one released. I really need a wood door, hollow metal, and hardware spec to make sure we are price competitive and bidding apples to apples.

A2. *See Division 8 Specifications as part of Addendum No. 1.*

2. Detail 7/S2.1 - West Addition Foundation

3. Projected Phasing Plan

4. Specifications

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DIVISION 00 - BIDDING AND CONTRACTING REQUIREMENTS

001100 Instructions to Bidders

004110 Bid Proposal Form

004313 Bid Bond

007200 Standard Contract Requirements (City)

007337 Economic Opportunity Plan (EOP)

007343 Prevailing Wage Rates Schedule

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RFP for Health Care Center No. 10, Interior Improvements and Additions
2230 Cottman Ave, Philadelphia, PA 19149

DIVISION 01 -- GENERAL PROJECT REQUIREMENTS

011200 Summary of Work
012100 Allowances
012500 Substitution Procedures
012600 Contract Modification Procedures
- Change Order Form
012900 Payment Procedures
012973 Schedule of Values
013113 Project Coordination
013119 Project Meetings
013216 Construction Scheduling
013226 Progress Reports
013233 Construction Photographs
013300 Submittals
014100 Codes, Regulations and Standards
014516 Contractor's Quality Control
015000 Temporary Facilities and Controls
015719 Environmental Controls
016001 Products and Materials
017700 Closeout Procedures
-Certificate of Substantial Completion Form
017823 Operation and Maintenance Manuals
017836 Warranties
017839 Project Record Documents

DIVISION 3 – CONCRETE

033000 Cast-In-Place Concrete

DIVISION 4 – MASONRY

042200 Concrete Unit Masonry

DIVISION 5 – METALS

053000 Structural Steel
053100 Steel Decking
055000 Metal Fabrications

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES

061053 Miscellaneous Rough Carpentry
064100 Architectural Casework
064600 Wood Trim
066500 Exterior Synthetic (Poly-Ash) Trim

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2230 Cottman Ave, Philadelphia, PA 19149

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

070152 Roof Penetrations and Patching
072100 Thermal Insulation
072726 Fluid Applied Membrane Air Barriers
074649 Poly-Ash Siding
075216 SBS Modified Bituminous Roofing
076200 Sheet Metal Flashing and Trim
079100 Preformed Joint Sealants
079200 Joint Sealants

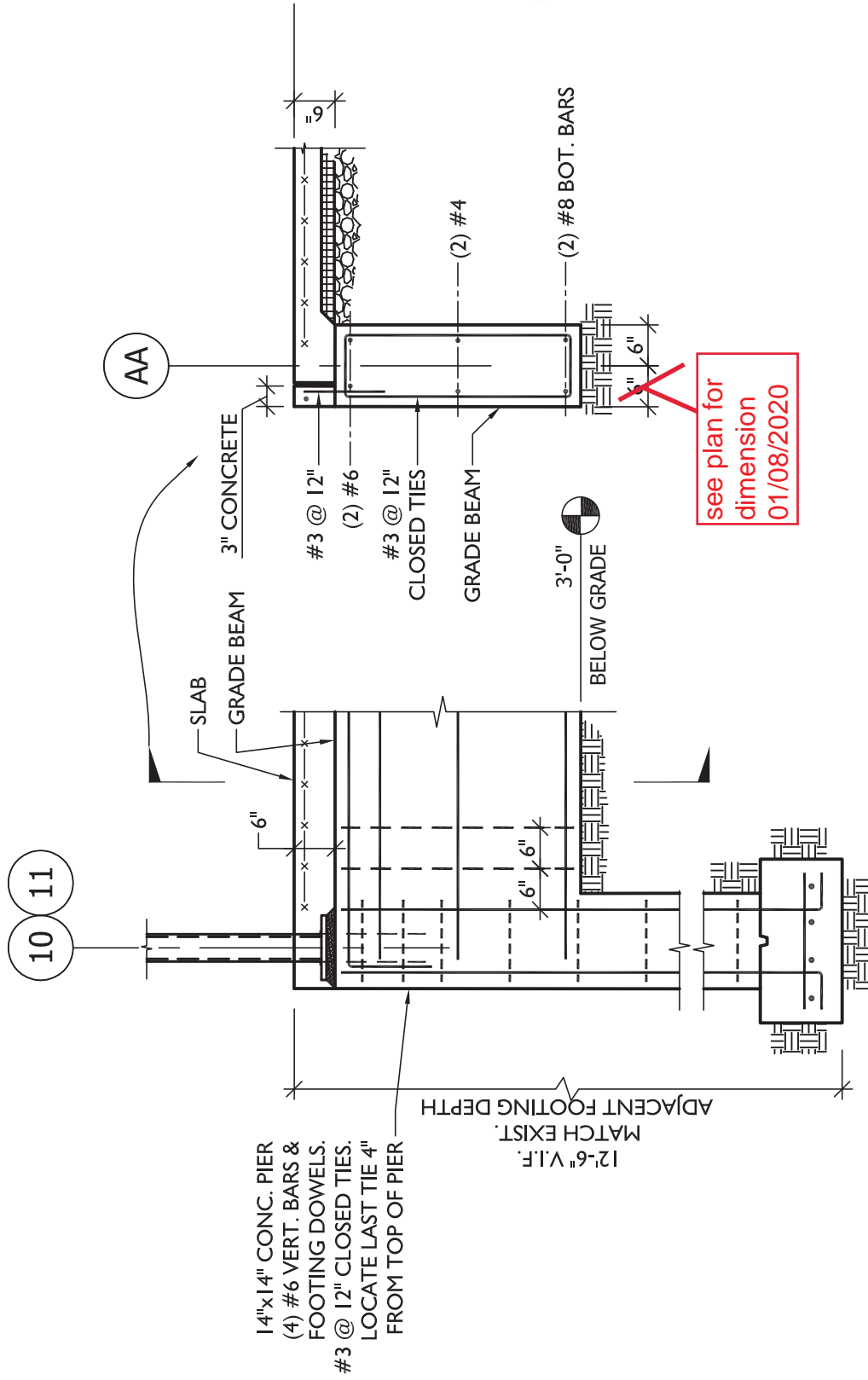
DIVISION 8 - OPENINGS

081113 Hollow Metal Doors and Frames
081416 Flush Wood Doors
083100 Access Doors and Panels
084113 Aluminum-Framed Entrances and Storefronts
084413 Glazed Aluminum Curtain Walls
085113 Aluminum Windows
087110 Door Hardware
088000 Glazing

DIVISION 9 - FINISHES

092216 Non-Structural Metal Framing
092900 Gypsum Board
095113 Acoustic Panel Ceilings
096513 Resilient Base and Accessories
096516 Resilient Sheet Flooring
096519 Resilient Tile Flooring
099000 Painting and Coating

End of Addendum



7 WEST ADDITION FOUNDATION

S2.1 SCALE: 1/2" = 1'-0"

**Projected Phasing Plan
March – September 2020:**

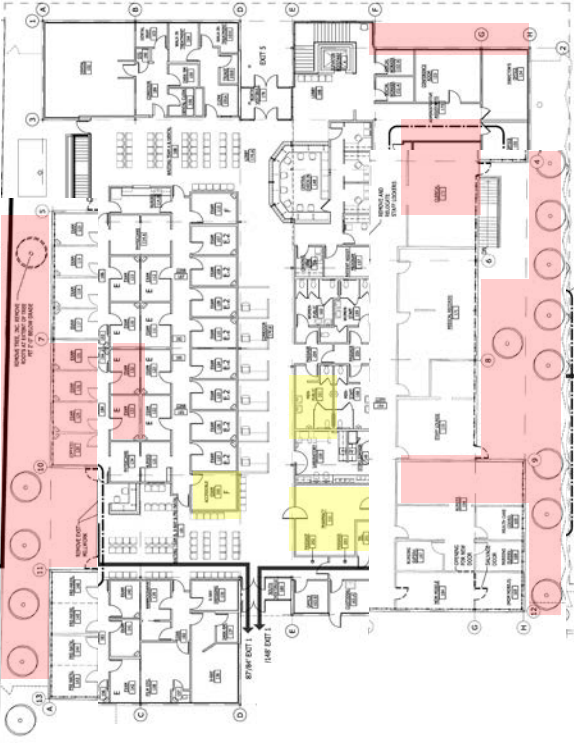
- Phase 1: 2 to 4 Weeks**
- A. Mobilization
 - B. Tree Removal As Required
 - C. Exam Rooms 128-133
 - D. Office 166 and Open Office 172

- Phase 2: 2 to 4 Weeks**
- A. Interior/Exterior Demo: East (Lunch/Nurse's Room, Records) and West (Team B Waiting)
 - B. Exam Rooms 115 – 120

- Phase 3: 4 to 8 Weeks**
- A. Excavation and Foundations
 - B. New Construction: East and West Additions and Interior
 - C. Exam Rooms 107 – 113

- Phase 4: 4 to 8 Weeks**
- A. Fit Out: East and West Additions
 - B. New Concrete Paving and Unit Pavers
 - C. Triage Rooms
 - D. New Landscape and Fixtures
 - E. Fence: Remove and Install New
 - F. Closeout

- Phase 5: During Construction Per Health Dept. Notice to Proceed.**
- A. Pharmacy: Complete In 2 Calendar Weeks (14 Straight Days)
 - B. Toilet Rooms: (Men's/Women's, Public/Staff): Complete work for each on a weekend (4 weekends total)
 - C. Exam Room 200: Demo and New Construction By Allowance



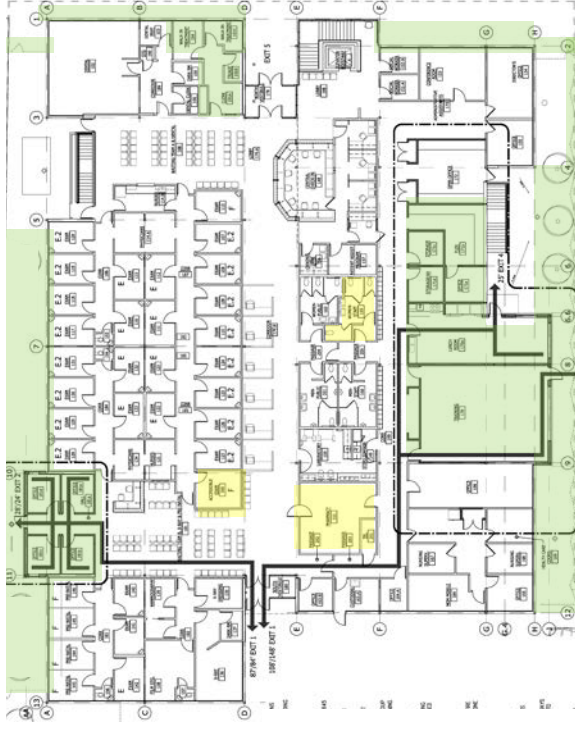
Phase 1



Phase 2



Phase 3



Phase 4



CITY OF PHILADELPHIA
DEPARTMENT OF PUBLIC PROPERTY
CAPITAL PROJECTS DIVISION - HHS
CITY HALL ROOM 702 - 1400 JOHN F. KENNEDY BLVD
PHILADELPHIA PENNSYLVANIA 19107

RFP for Health Care Center No. 10

Interior and Exterior and Additions
2233 Cottman Ave, Philadelphia, PA 19149

January 9, 2020

DPP Project No.
14-18-4745-01

Phasing Plan
Addendum No. 1



PROJECT MANUAL



**PHILADELPHIA
REDEVELOPMENT
AUTHORITY**

HEALTH CARE CENTER NO. 10
2230 COTTMAN AVENUE, PHILADELPHIA, PA 19149
INTERIOR IMPROVEMENTS AND ADDITIONS

PHILADELPHIA REDEVELOPMENT AUTHORITY



A Mandatory Pre-Bid Conference will be held on **Monday, December 30, 2019 at 10:00 AM** at Health Care Center No. 10, located at 2230 Cottman Avenue, Philadelphia, PA 19149.







Sealed Bids will be received until **2:00 PM, Thursday, January 16, 2020** at the Philadelphia Redevelopment Authority, 1234 Market Street, 16th Floor, Philadelphia, PA 19107, Attn: Robert LaBrum, Director, Design and Construction, and will be opened immediately thereafter.

HEALTH CARE CENTER NO. 10
INTERIOR IMPROVEMENTS AND ADDITIONS
























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-  007337 Economic Opportunity Plan (EOP)
-  007343 Prevailing Wage Rates Schedule

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-  013300 Submittals
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-  015000 Temporary Facilities and Controls
-  015719 Environmental Controls
-  016001 Products and Materials
-  017700 Closeout Procedures
-Certificate of Substantial Completion Form
-  017823 Operation and Maintenance Manuals
-  017836 Warranties
-  017839 Project Record Documents

DIVISION 3 – CONCRETE

1 033000 Cast-In-Place Concrete

DIVISION 4 – MASONRY

1 042200 Concrete Unit Masonry

DIVISION 5 – METALS

1 053000 Structural Steel

1 053100 Steel Decking

1 055000 Metal Fabrications

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITES

1 061053 Miscellaneous Rough Carpentry

1 064100 Architectural Casework

1 064600 Wood Trim

1 066500 Exterior Synthetic (Poly-Ash) Trim

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

1 070152 Roof Penetrations and Patching

1 072100 Thermal Insulation

1 072726 Fluid Applied Membrane Air Barriers

1 074256 Fiber Cement Wall Panels

1 074649 Poly-Ash Siding

1 075216 SBS Modified Bituminous Roofing

1 076200 Sheet Metal Flashing and Trim

1 079200 Joint Sealants

DIVISION 8 - OPENINGS

1 081113 Hollow Metal Doors and Frames

1 081416 Flush Wood Doors

1 083100 Access Doors and Panels

1 084113 Aluminum-Framed Entrances and Storefronts

1 084413 Glazed Alum Curtain Walls

1 085113 Aluminum Windows

1 087110 Door Hardware

1 088000 Glazing

DIVISION 9 - FINISHES




1 092216 Non-Structural Metal Framing

1 092900 Gypsum Board

1 095113 Acoustic Panel Ceilings

1 096513 Resilient Base and Accessories

DIVISION 9 – FINISHES (continued)

-  096516 Resilient Sheet Flooring
-  096519 Resilient Tile Flooring
-  099000 Painting and Coating

DIVISION 22 - PLUMBING

- 220509 General Requirements – Plumbing
- 220517 Sleeves & Seals for Plumbing Piping
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- 220529 Hangers & Support for Plumbing Piping & Equipment
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DIVISION 22 – PLUMBING (Continued)

- 221116 Domestic Water Piping
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- 221319 Sanitary Waste Piping Specialties
- 224000 Plumbing Fixtures

DIVISION 23 - HVAC

- 230523 General Duty Valves for HVAC Piping
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- 230593 Testing, Adjusting & Balancing (Tab) for HVAC
- 230700 HVAC Insulation
- 230900 Instrumentation & Controls for HVAC
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- 233113 Metal Ducts
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- 238216 Air Coils

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- 260500 Common Work Results for Electrical
- 260501 Work in Existing Building

DIVISION 26 - ELECTRICAL

- 260519 Low-Voltage Electrical Power Conductors & Cables
- 260526 Grounding & Bonding for Electrical Systems
- 260529 Hangers & Supports for Electrical Systems
- 260553 Raceway & Boxes for Electrical Systems
- 260553 Identification for Electrical Systems
- 260923 Lighting Control Devices
- 262726 Wiring Devices
- 265113 Interior Lighting

PROJECT DRAWINGS:

- A. East & West Additions Drawings
- B. Exam Rooms Drawings
- C. Pharmacy Improvements Drawings
- D. Restroom Improvements Drawings
- E. Site Improvements Drawings
- F. Walk-In and Triage Exam Room Drawings

END OF SECTION



SECTION 001100
INSTRUCTIONS TO BIDDERS

PART 1—GENERAL

1.1 BASIC INFORMATION

- A. The following is a list of basic bidding information for the convenience of Bidders. If discrepancies between information contained in this section and other Bidding Documents are uncovered, the requirements of the other Bidding Documents shall govern.

The entire project must be bid by a Single Prime General Contractor. Work does not need to be performed under separate prime contracts. Please disregard the reference of the need for separate Prime Contracts for Mechanical, Electrical, etc.

1. Project Title: **Health Care Center No. 10 - Interior Improvements and Additions**
2. Project Location:
**Health Care Center No. 10
2230 Cottman Avenue, Philadelphia, PA 19149**
3. Bids must be submitted prior to the deadline indicated on the Project Manual Cover.
4. Bids shall be delivered to the Philadelphia Redevelopment Authority (PRA), 1234 Market Street, 16th Floor, Philadelphia, PA, Attn: Robert LaBrum, Director, Design and Construction.
5. Submit one (1) original, complete, signed, Bid for Project.
6. Allowances are included.
7. Bids shall be valid for 60 calendar days after bid opening unless otherwise mutually extended by PRA and apparent low bidder.
8. Access to the site for inspection by the Bidders will be part of the mandatory pre-bid conference scheduled on the cover.
9. It should be understood and agreed by this bidder that funding for this project will be partially certified. It should be further understood that additional funding is subject to councilmatic appropriation of funds. Should the PRA fail to appropriate the necessary additional funds for this project, the Contract for that portion of the work not funded shall terminate automatically, without penalty, cost or liability to the PRA.

1.2 INVOLVED PARTIES:

- A. Contracting Agency:
Philadelphia Redevelopment Authority (PRA), 1234 Market Street, 16th Floor,
Philadelphia, PA, 19107
Robert LaBrum, Director, Design and Construction, Phone: 215-448-3046
Dennis Torres, Architect, Phone: 215-448-3075
- B. Project Architect:
Bolender Architects
2118 Locust Street, Philadelphia, PA 19103

HEALTH CARE CENTER NO. 10
INTERIOR IMPROVEMENTS AND ADDITIONS
001100-1
INSTRUCTIONS TO BIDDERS

Phone: 215-731-0390

- C. Mechanical, Plumbing, Electrical & Life Safety Engineer:
Sera Engineering
1700 Sansom Street, Philadelphia, PA 19103
Phone: 215-438-4464
- D. Structural Engineer:
Anne Rothman Structural Engineering, LLC
100 E. Lancaster Avenue, Suite 203, Wayne, PA 19087
Phone: 610-688-2566
- E. City of Philadelphia:
Department of Public Property

1.3 DEFINITIONS

- A. Refer to Section 00700, "Standard Contract Requirements".

1.4 BIDDER'S REPRESENTATIONS

- A. Each Bidder by submitting a Bid represents that:
 - 1. The Bidder has read and understands the Bidding Documents and the Bid is made in accordance therewith.
 - 2. The Bidder has visited the site and is familiar with the local conditions under which the Work is to be performed and has correlated site observations with the requirements of the proposed Contract Documents.
 - 3. Bid is based upon the materials, systems and equipment required by the Bidding Documents without exception.
- B. The PRA assumes no responsibility for any representation made by any of its officers, agents, or employees concerning the nature of the Work or the general and local conditions unless such representation is included in the Contract Documents or Addenda.

1.5 BIDDING DOCUMENTS

- A. Copies of the Bidding Documents are available from Philadelphia Redevelopment Authority (PRA), 1234 Market Street, 16th Floor, Philadelphia, PA, Attn: Robert LaBrum, Director, Design and Construction.
- B. Only complete sets of Bidding Documents are available. No individual pages or partial sets will be issued. Errors or misinterpretations in the Bid resulting from the use of incomplete sets of Bidding Documents will not give cause to adjust the Contract.
- C. PRA, in making copies of the Bidding Documents available on the above terms, does so only for the purpose of obtaining Bids on the Work and does not confer a license or agreement for any other use.
- D. Title to all Bidding Documents shall remain with the PRA.

1.6. INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

- A. Bidders shall promptly notify the PRA of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding Documents or of the site and local conditions.
- B. Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Project Coordinator at least six (6) calendar days prior to the deadline for submission of Bids.
- C. Clarifications or interpretations received prior to deadline for submission of Bids shall either be addressed in an Addendum which may also include an extension of the deadline for submission of Bids, or at the sole discretion of the PRA, no additional information will be issued and the Bidders shall comply with the Bidding Documents as they exist.
- D. Any interpretation, correction or change of the Bidding Documents will be made by Addendum. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.

1.7. SUBSTITUTIONS

- A. Requests for substitutions shall comply with Section 01630, "Substitution Procedures."

1.8. ADDENDA

- A. Addenda will be mailed or delivered to all known to have received a set of Bidding Documents or Qualified Bidders after the questionnaire due date.
- B. Copies of Addenda will be made available for copy and inspection at the Procurement Office.
- C. Each Bidder shall ascertain prior to submitting Bid that Bidder has received all Addenda issued, and shall acknowledge their receipt in Bid.

1.9 BIDDING PROCEDURES

- A. Form and Style of Bids:
 - 1. Submit Bids on forms provided in the Loose Proposal package.
 - 2. Fill in blanks on the Bid by typewriter or otherwise in ink.
 - 3. Where so indicated by the makeup of the Bid, express sums in both words and figures.
 - 4. The signer of the Bid must initial any interlineation, alteration or erasure.
 - 5. All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."
 - 6. Bids shall not contain any conditions or qualifications whatsoever.
 - 7. Bids shall include an allowance for permits and licenses in connection with all or any portion of the work.
 - 8. All coordination needed to procure and obtain the required permits and licenses necessary to perform the work in its entirety shall be the responsibility of the bidder/contractor. Payment under this allowance

shall be for the actual permit or license fee(s). Additional costs to procure such permits or licenses will not be reimbursed to the bidder/contractor. Refer to section 007200 Standard Contract Requirements, Clause 34.

- B. Bid Security, See Section 00700 Standard Contract Requirements, Section 10.1.
 - 1. Each Bid shall be accompanied by bid bond as per the requirements of the Standard Contract Requirements for Public Works Contracts.
 - 2. Bid Bond shall be issued on form included in the Loose Proposal Package.
 - C. Submission of Bids
 - 1. The Bid, bid security, and other required documents shall be enclosed in a sealed opaque envelope identifying the Project name, the Bidder's name and address and the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "Sealed Bid Enclosed" on the face thereof.
 - 2. Deposit Bids at the designated location prior to the time and date for submission of Bids indicated in the Invitation to Bid, or any extension thereof made by Addendum. Bids received after the time and date for submission of Bid will be rejected.
 - 3. The Bidder shall assume full responsibility for timely delivery at the location designated for submission of Bid.
 - 4. Oral, telephonic or telegraphic Bids are invalid and will not receive consideration.
 - D. Modification or Withdrawal of Bid
 - 1. A Bid may not be modified, withdrawn or canceled by the Bidder after the time and date designated for the receipt of Bids except as provided in the Standard Contract Requirements for Public Works Contracts.
 - 2. Prior to the time and date designated for receipt of Bids, any Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for submission of Bids. Such notice shall be in writing on company letterhead under the signature of the Bidder.
 - 3. Withdrawn Bids may be resubmitted up to the time designated for the submission of Bids provided that they are then fully in conformance with these Instructions to Bidders.
- 1.10 CONSIDERATION OF BIDS
- A. Opening of Bids: Properly identified Bids received on time will be opened publicly.
 - B. Rejection of Bids: The PRA has the right to reject any or all Bids and to reject a Bid not accompanied by data required by the Bidding Documents, or to reject a Bid which is in any way incomplete or irregular.
 - C. Acceptance of Bid (Award)

1. It is the intent of the City to award a Contract to the lowest responsive and responsible Bidder.
2. If Alternates are to be included in the award, they will be accepted in the order listed.

1.11 CONTRACT PROCESSING

- A. Successful bidder shall be mailed Contract forms from Philadelphia Redevelopment Authority (PRA), 1234 Market Street, 16th Floor, Philadelphia, PA, Attn: Robert LaBrum, Director, Design and Construction and shall return properly executed contract forms and bond forms within ten (10) working days Philadelphia Redevelopment Authority (PRA), 1234 Market Street, 16th Floor, Philadelphia, PA, Attn: Robert LaBrum, Director, Design and Construction
- B. The PRA may vacate awards for failure to comply with provisions above.

1.12 PERFORMANCE BONDS

- A. Bond Requirements: Bidder shall furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder per the requirements of the Standard Contract Requirements and other requirements of the Bidding Documents.
- B. Bidder shall provide and furnish bonds to the contract limit which includes the contingency.

1.13 INSURANCE CERTIFICATES

- A. The successful Bidder will not be permitted to start any Work under the Contract until certificates covering all insurance requirements are submitted per the Standard Contract Requirements and other requirements of the Bidding Documents.

1.14 PRE-BID INFORMATION

- A. Pre-bid information regarding the Project is correct and current at the time it is issued, and is offered to obtain Bids.
- B. The pre-bid information cannot be guaranteed to remain correct in every detail throughout the time preceding the signing of the Contract due to such variables as changes in budget, labor and material markets and anticipated date of issuing the notice to proceed.

1.15 INFORMATION AVAILABLE TO BIDDERS

- A. Geotechnical Information
 1. Not applicable
- B. Site Visit
 1. Bidders shall make themselves familiar with all readily observable features of the Project Site. Readily observable features include spaces above lay-in ceilings, behind access panels and other similar areas not normally exposed to view but easily accessible.
 2. Bidder shall not rely solely on Contract Drawings or Record Drawings.
 3. Uncovered conditions differing substantially from those indicated on Record Drawings and not observable during the pre-bid visit will be considered for modification to the Contract.

C. Record Drawings

1. Record drawings of existing construction can be made available to Bidder at cost of reproduction for use in preparing bids.
2. Record Drawings were used for design purposes only, and shall not be used for construction.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 004110
BID PROPOSAL FORM

PHILADELPHIA REDEVELOPMENT AUTHORITY

**HEALTH CARE CENTER NO. 10
2230 COTTMAN AVENUE, PHILADELPHIA, PA 19149
INTERIOR IMPROVEMENTS AND ADDITIONS**

SEALED BIDS WILL BE RECEIVED UNTIL 2:00 PM, THURSDAY, JANUARY 16, 2020, AT THE PHILADELPHIA REDEVELOPMENT AUTHORITY, 1234 MARKET STREET, 16TH FLOOR, PHILADELPHIA, PA 19107, ATTN: ROBERT LABRUM, AND WILL BE OPENED IMMEDIATELY THEREAFTER.

THIS BID FORM IS COMPLETE, AND MUST NOT BE SEPARATED. IF ANY SHEET OR SHEETS ARE DETACHED WHEN SUBMITTED AS A BID, THE PHILADELPHIA REDEVELOPMENT AUTHORITY RESERVES THE RIGHT TO REJECT YOUR BID.

FIRM NAME

FIRM ADDRESS

FEDERAL EIN

PHILADELPHIA BUSINESS TAX ID

TOTAL BASE BID

To the Philadelphia Redevelopment Authority:

I, the undersigned Bidder, hereby propose to furnish all the labor, materials and equipment, perform the whole of the work, and submit to all conditions, as represented, intended and implied, both particularly and generally, by the Plans, Special Specifications, Standard Specifications, Standard Details, Standard Contract Requirements, Form of Agreement, the Ordinance authorizing the work and this bid at the prices herein stated, and agrees that each item bid shall be complete in itself, and the Philadelphia Redevelopment Authority may increase or diminish the amount of work thereunder, or omit the item without invalidating the unit price bid for it or any other item, on the following terms to wit:

A. BID AMOUNT

I will complete the Work in accordance with the Contract Documents for the following Bid Amount as defined in Section 007200, Standard Contract Requirements. (Insert Bid Amount in words as well as figures.)

(1) BASE BID AMOUNT: _____

DOLLARS, \$ _____

(2) ALLOWANCE No. 1 Bidders are to include the amount equal to Two Percent (2%) of their base bid amount for payment of Permit and License fees to all regulatory agencies. Refer to Allowances, Section 012100 for more details.

ALLOWANCE AMOUNT: _____

DOLLARS, \$ _____

(3) ALLOWANCE No. 2 Bidders are to include the amount of \$50,000.00 (fifty-thousand) for miscellaneous modifications to existing spaces. Refer to Allowances, Section 012100 for more details.

ALLOWANCE AMOUNT: _____

DOLLARS, \$ _____

TOTAL BASE BID:

Base Bid plus Allowance(s): _____

DOLLARS, \$ _____

B. PERFORMANCE OF THE WORK BY CONTRACTOR:

I, the undersigned Contracting Bidder, am required to perform work on the site with its own workforce equal to at least twenty percent (20%) of the original total contract price exclusive of profit, overhead and the costs of procuring insurance and bonds. I, the undersigned Contracting Bidder, shall submit with its bid a complete description of the work that will be performed (e.g., earthwork, paving, brickwork, roofing, etc.), the percentage of the total contract this work represents, and the estimated dollar value thereof.

I shall perform the following work: _____

Percentage of the total contract to be performed by Contracting Bidder: _____

Estimated cost of work to be performed by Contracting Bidder: \$ _____

C. COMPLETION

I will substantially complete the Work, ready for final payment, in accordance with the Contract Documents within 150 consecutive calendar days counting from the date stated in the Notice to Proceed.

D. ADDENDA

Bidder must attach Addendum Acknowledgement sheets for all Addenda, if applicable.

Addendum #1, dated: 09 January 2020

Addendum #2, dated: 09 January 2020

EXECUTION OF CONTRACT

This contract consists of the Standard Contract Requirements; the Department’s Standard Details and Specifications, as they apply; the Department’s General Bidding and Contract Requirements; the Technical Specifications; the Bid; the Plans with all of the notes thereon (excluding any records or reports of test borings, underground structures, and test piles); any additional exhibits or attachments to any of the foregoing; and any addenda thereto issued by the City (collectively, the “Contract”).

NOTE: ANY CONTRACT THAT IS NOT EXECUTED IN ACCORDANCE WITH THE INSTRUCTIONS PROVIDED BELOW, MAY, IN THE SOLE DISCRETION OF THE PHILADELPHIA REDEVELOPMENT AUTHORITY, BE REJECTED.

SIGNING OF CONTRACT

If Contractor is an INDIVIDUAL or a PARTNERSHIP, date and sign the Contract here, with original signatures, in ink.

This _____ day of _____ 2020

(Signature of Owner, Partner)

(Type or Print Name and Title)

(Business Name of Bidder)

If Contractor is a CORPORATION, date and sign the Contract here with original signatures, in ink, by (a) President or Vice-President of the corporation AND (b) Secretary, Assistant Secretary, Treasurer or Assistant Treasurer of the corporation; and (c) affix the seal of the corporation. If the Contract is not signed by the President or Vice-President; and Secretary, Assistant Secretary; Treasurer or Assistant Treasurer, attach a duly certified corporate resolution authorizing the person signing in place of such officers to execute this Contract for the corporation.

This _____ day of _____ 2020

CORPORATE SEAL

(Corporate or Business Name of Bidder)

(Address, Including Zip Code)

(Telephone Number)

(Signature of President or Vice President)

(Signature of Secretary, Asst. Secretary, Treasurer or Assistant Treasurer)

(Type or Print Name and Title)

(Type or Print Name and Title)



SECTION 004313
BID BOND

**PROJECT NAME: HEALTH CARE CENTER NO. 10
INTERIOR IMPROVEMENTS AND ADDITIONS**

FOR THE PHILADELPHIA REDEVELOPMENT AUTHORITY, KNOW ALL MEN BY THESE PRESENT, that we

as Principal (hereinafter called the "Principal Obligor"), and _____

Surety, are jointly and severally held firmly bound unto the Philadelphia Redevelopment Authority, in the sum of:

TEN PERCENT (10%) OF THE GROSS AMOUNT OF THE BID

lawful money in the United States of America, to be paid to the said Philadelphia Redevelopment Authority, its successors and assigns, to which payment well and truly to be made, we do bind ourselves and each of us, our and each of our successors and assigns, jointly and severally, firmly by these present.

Sealed with our seals and dated the _____ day of _____, A.D. 2020

WHEREAS, the above bonded Principal Obligor, submitted a bid pursuant to the above referenced Bid Number to perform certain work for the Philadelphia Redevelopment Authority.

NOW, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Philadelphia Redevelopment Authority shall accept the bid of the Principal Obligor and the Principal Obligor shall enter into a contract with the Philadelphia Redevelopment Authority in accordance with the terms of such bid, and furnish such bond or bonds as are specified in the bid documents with good and sufficient surety, for the faithful performance of the contract and for the prompt payment of labor and material furnished in the prosecution thereof; or in the event of the failure or refusal of the Principal Obligor to enter such contract and give such bond or bonds, if the Principal Obligor shall pay to the Philadelphia Redevelopment Authority the difference between the amount specified in said bid and such larger amount for which the Philadelphia Redevelopment Authority may legally contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

And we do for ourselves and each of us, our and each of our heirs, executors, administrators, successors and assigns, hereby authorize and empower the Solicitor of Philadelphia Redevelopment Authority or any other attorney of any court of record in Pennsylvania or elsewhere by him or her deputized for the purpose, upon the filing of this instrument or a copy thereof, duly attested as correct by the Solicitor of the Philadelphia Redevelopment Authority, to appear for us or either of us, our or

HEALTH CARE CENTER NO.10
INTERIOR IMPROVEMENTS AND ADDITIONS
004313-1
BID BOND

either of our heirs, executors, administrators, successors or assigns, and confess a judgment against us or either of us, our or either of our heirs, executors, administrators, successors or assigns, in favor of the Philadelphia Redevelopment Authority for the sum named in this bond, without defalcation, with costs of suit, release of errors, and with five percent added for collection fees; hereby waiving the benefit of all exemption laws and the holding of inquisition of any real estate that may be levied upon by virtue of such judgment, voluntarily condemning such real estate and authorizing the entry of such condemnation upon any writ of fieri facias and agreeing that said real estate may be sold under the same; and further waiving all errors, defects and imperfections whatsoever in the entering of the said judgment or any process thereon, and hereby agreeing that no writ of error or objection of motion or rule to open or strike off judgment or to stay execution or appeal, shall be made or taken thereto.

And for the doing of these acts, this instrument or a copy thereof attested as aforesaid shall be full warrant and authority.

CORPORATE SEAL:

PRINCIPAL OBLIGOR:

_____(SEAL)
President or Vice President

_____(SEAL)
Secretary or Treasurer
(or either of their assistants)

_____(SEAL)
Secretary or Treasurer

SURETY:

_____(SEAL)
Attorney-In-Fact

-
- Note: (1) All bidders must utilize this Bid Bond Form when submitting a bid to the Philadelphia Redevelopment Authority.
- (2) If Principal Obligor is an individual or partnership, Bid Bond should be signed by owner or authorized general partner. Please identify on the Bid Bond the type of business (e.g. individual proprietorship or partnership) and title of party executing the Bid Bond.
- (3) Bid Bond must be executed by a surety company duly authorized and licensed to act as surety by the Pennsylvania Insurance Commissioner pursuant to the laws of the Commonwealth of Pennsylvania.



CITY OF PHILADELPHIA



**STANDARD CONTRACT REQUIREMENTS
FOR PUBLIC WORKS CONTRACTS**

PROCUREMENT DEPARTMENT

January 1, 2019

CITY OF PHILADELPHIA
STANDARD CONTRACT REQUIREMENTS

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STANDARD CONTRACT REQUIREMENTS

A. DEFINITIONS

1. **Definitions.** The terms used in the Contract Documents shall have the following meanings:
 - a. "ADA" has the meaning set forth in Paragraph 113 below.
 - b. "Amendment" means a written modification or change to any Contract Document signed by both Parties.
 - c. "Applicable Law" means all applicable present and future federal, state or local laws, ordinances, executive orders, rules, regulations and all court orders, injunctions, decrees and other official interpretations thereof of any federal, state or local court, administrative agency or governmental body, including the City of Philadelphia ("City"), the Commonwealth of Pennsylvania ("Commonwealth") and the United States of America ("USA"). Applicable Law includes, without limitation, laws, etc. relating to the environment, the Philadelphia Home Rule Charter ("HRC"), as amended from time to time, The Philadelphia Code ("Code"), as amended from time to time, and the specific laws set forth in Paragraphs 107–116 below, each as amended from time to time. Sellers submit quotes, and the parties execute, deliver and perform their respective obligations under the Contract, under and pursuant to the applicable provisions of all Acts of the General Assembly of the Commonwealth and applicable ordinances of the City, as such enactments may hereafter be supplemented or amended.
 - d. "Application for Final Estimate" has the meaning set forth in Paragraph 56 below.
 - e. "Application for Payment" has the meaning set forth in Paragraph 52 below.
 - f. "Application for Semi-Final Estimate" has the meaning set forth in Paragraph 55 below.
 - g. "Bid Solicitation" means a public invitation to submit competitive Quotes for a specific City contract or City contracts that is or are issued by the Procurement Department in accordance with Sections 8-200(1), 2(a) and 2(b) of the Philadelphia Home Rule Charter. A Bid Solicitation includes all addenda thereto issued by the Procurement Department.
 - h. "Change Order" means an instrument altering the scope of the work under the Contract issued under Paragraph 48 below.
 - i. The "City" means The City of Philadelphia, a corporation and body politic existing under the laws of the Commonwealth, and includes its various executive and administrative departments, agencies, boards and commissions, including the Department, and its legislature, City Council. The City is a City of the First Class under the laws of the Commonwealth.
 - j. "City Work" has the meaning specified in Paragraph 107(d) below.
 - k. "Contingent Price" means a price for a unit or component of work specified on the "Contingent Price List" published from time to time by the City.
 - l. "Commonwealth" means the Commonwealth of Pennsylvania.
 - m. "Contract" means the agreement of the Parties evidenced by the Contract Documents.
 - n. "Contract Documents" means the Standard Contract Requirements; the Department's Standard Details and Specifications, as they apply; the Department's General Bidding and Contract Requirements; the Technical Specifications; the Quote; the Plans with all of the notes thereon (excluding any records or reports of test borings, underground structures, and test piles); the Notice to Proceed ("NTP"), the Notice of Contract Award

("NCA"), the performance bond and the payment bond, as prepared by the Department and issued with the Bid Solicitation, and includes all exhibits, schedules and addenda, if any, to any of the foregoing documents, and any and all Amendments and Change Orders.

o. "Contractor" means the Person that has entered into the Contract with the City, has had its authorized individual(s) sign the Contract Documents on behalf of the Person but does not include, without the City's written consent, any subsidiary, affiliate, agent, etc., or parent company, if any, of the Contractor.

p. "Current Estimate" has the meaning set forth in Paragraph 53 below.

q. "Department" means the department, board, commission, or agency of the City for which the Contractor carries out the work under the Contract, except when the Department of Public Property ("DPP") supervises the Contract, in which case "Department" means the Department of Public Property.

r. "Disputed Change Order" means a Change Order issued by the City under Paragraph 49 below.

s. "Event of Insolvency" means (a) the filing of a voluntary petition by the Contractor under the Federal Bankruptcy Code or any similar state or federal law; or (b) the filing of an involuntary petition against The Contractor under the Federal Bankruptcy Code or any similar state or federal law which remains undismissed for a period of forty-five (45) days; or (c) the Contractor's making of an assignment for the benefit of creditors; or (d) the appointment of a receiver for the Contractor or for the property or assets of the Contractor, if such appointment is not vacated within forty-five (45) days thereafter; or (e) any other proceeding under any bankruptcy or insolvency law or liquidation law, voluntary or otherwise; or (f) the Contractor proves unable to pay its obligations as they mature; or (g) the Contractor is insolvent as otherwise defined under any Applicable Law.

t. "General Bidding and Contract Requirements" means the additional bidding and contract conditions and requirements specifically prepared by the Department for a specific Bid Solicitation (which may accompany the Technical Specifications) and may from time to time include, but not be limited to, Quote proposal forms, special or additional or supplementary instructions to Sellers, minimum wage rate schedules, prevailing wage rate schedules, contingent price lists, requirements of the City's Office of Economic Opportunity ("OEO"), and general tax requirements.

u. "Inspector" means the representative of the City's Project Manager assigned to inspect work and the delivery of services under the Contract.

v. "Lump Sum Bid Breakdown" has the meaning set forth in Paragraph 52 below.

w. "Notice of Contract Award" (NCA) means a notice from the City to the Seller informing the Seller of the City's determination to award the Contract to the Seller.

x. "Notice to Proceed" (NTP) means a notice from the City to the Contractor authorizing the Contractor to commence work under the Contract.

y. "Operating Commissioner" means the director, commissioner, or other head of the Department issuing the work to the Contractor pursuant to the Contract.

z. "Parties" means the City and the Contractor, and a "Party" means either the City or the Contractor.

aa. "Person" means any individual, sole proprietorship, association, company, firm, partnership, limited partnership, joint venture, corporation, limited liability company or other form of entity or association recognized at law.

bb. "PGW" means the Philadelphia Gas Works.

cc. "Plans" means the general plans and design drawings which accompany the Technical Specifications, the Standard Details and Specifications, and such detail and supplementary drawings as may be furnished from time to time.

dd. "Procurement Commissioner" means the head of the City's Procurement Department, or his or her designee.

ee. "Procurement Department" means the Procurement Department of the City.

ff. "Project" means all of the work which the City seeks to complete at the Project site, including, but not limited to, the work which the Contractor has agreed to perform under the Contract. The Project includes other work at the Project site by the City and by other contractors pursuant to other City contracts.

gg. "Project Manager" means the designated representative of the City officer in charge of the construction branch, division or unit of the Department, or the individual specifically designated as "Project Manager" in the Technical Specifications, and any other individual who may be designated in writing by the Project Manager as his or her representative. The City may delegate or provide for the performance of certain of the duties and functions of the Project Manager by architectural or engineering firms under contract with the City.

hh. "Proposal" means a Seller's price and other specific terms and conditions included in a Quote.

ii. "Public Works Contract(s)" means any contract awarded by the Procurement Department for the construction, reconstruction, alteration, or repair of any public building or other public work or public improvement within the City and County of Philadelphia.

jj. "Quote" means a Seller's signed response, including a Proposal, submitted to the Procurement Department pursuant to a Bid Solicitation.

kk. "Responsibility" or "Responsible" means the capacity to perform a City contract in accordance with its terms and conditions. Elements of Responsibility include the following, among others: judgment, skill, promptness, faithfulness, skillful workers, honesty of the Contractor, financial standing, reputation, experience, resources, facilities, past history of adherence to plans and specifications, capacity and ability to do the work according to the plans and specifications, availability and efficiency, and such other factors as may be determined by law and the City.

ll. "Seller" means a Person submitting a Quote, signed by the Person, to the Procurement Department pursuant to a Bid Solicitation. Seller includes only the Person who signs the Contract. Seller does not include, without the written consent of the City, any subsidiary, affiliate, agent, etc., or parent company, if any, of the Person.

mm. "Semi-Final Estimate" has the meaning set forth in Paragraph 55.

nn. "Shop Drawings" means all drawings, diagrams, illustrations, brochures, schedules, performance charts, instructions, and other data which are prepared by the Contractor, its Subcontractors, suppliers, or distributors, or equipment fabricators or manufacturers, and which illustrate the manufacture or fabrication of the product or equipment or any part thereof, and which are submitted to the Department to establish that the materials, articles and components of equipment Contractor proposes to supply will, when installed, meet all requirements of the Contract Documents.

oo. "Standard Contract Requirements" or "SCR" means these Standard Contract Requirements of the City in connection with the Bid Solicitations for, and the award, execution, and performance of Public Works Contracts, except as modified by the Department's General Bidding and Contract Requirements, the Technical Specifications and Plans and any other special requirements for the Contract. These Standard Contract Requirements are attached to and form an integral part of the Contract Documents.

pp. "Standard Details and Specifications" means the standard details and specifications for specific,

recurring types of work or components thereof, as may be issued by the Department from time to time, *e.g.*, the Standard Details and Standard Specifications for Sewers, as issued by the Philadelphia Water Department, or the Standard Construction Items, as issued by the Department of Streets.

qq. "Structures" has the meaning set forth in Paragraph 83 below.

rr. "Subcontract" means a contract made between the Contractor and a Subcontractor, or between a Subcontractor and a sub-subcontractor at any tier, providing for the completion of one or more portions of the work which the Contractor has agreed to perform under the Contract, including agreements for the manufacture or supply of equipment, systems or components forming part of such work.

ss. "Subcontractor" means a Person performing at any tier under a contract with the Contractor or another Subcontractor one or more portions of the work which the Contractor has agreed to perform under the Contract. Subcontractors shall include, without limitation, vendors, manufacturers, suppliers, or other Persons contracting with a Subcontractor or the Contractor for the manufacture or supply of equipment, systems or components forming part of the work under the Contract. There is no contractual relationship (privity of contract) between the Contractor's Subcontractor, or a Subcontractor's subcontractor, and the City.

tt. "Substantial Completion" or "Substantially Complete" or "Substantially Completed" means that construction is sufficiently complete in accordance with Contract Documents and certified by the Project Manager, as modified by Change Orders or amendments, so that (a) the work under this Contract can be used, occupied or operated for its intended use, and (b) all applicable permits and licenses, including, if applicable, a statement or certificate of occupancy, shall have been duly issued by all government offices, including those of the City. In no event shall the Contract be certified as substantially complete until the Contractor has completed at least ninety percent (90%) of the work under the Contract.

uu. "Technical Specifications" means the written and detailed requirements, prepared by the Department, or its consultants or representatives, for materials, equipment, systems, standards and workmanship for the work under this Contract and related services to be performed under the Contract.

vv. "Unbalanced Quote" means an offer by the Contractor which (1) contains extremely low prices on items or types of work which are, as determined by the City in its sole discretion, unimportant or infrequently ordered or performed, and extremely high prices on items or types of work which are frequently ordered or performed, resulting in an effort to qualify as the low Seller while charging disproportionately high prices for certain items or types of work; or (2) contains prices for phases of the work to be performed early in the course of the work under this Contract that are, as determined by the City in its sole discretion, disproportionately high relative to prices for later phases of the work, resulting in payment of a disproportionately high percentage of the total Contract price early in the Contract period.

ww. "Working Days" means calendar days, less allowances for days or parts of days, in increments of one-quarter (1/4) day, for conditions entirely beyond the control of the Contractor as defined in Paragraph 25(c)(2); and also excludes New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, or the Monday thereafter when these days occur on Sunday, and Saturdays and Sundays shall not be considered as Working Days.

xx. "Working Drawings" means those drawings prepared by the Contractor to supplement the Plans and Shop Drawings to accurately and clearly depict all working and installation dimensions, arrangement and sectional views, units of equipment in the proposed positions for installation, details of required attachments and connections, and dimensioned locations between units and in relation to the existing and proposed structures. Working Drawings shall show all necessary details and information for making connections between the various trades including, but not limited to, power supplies and interconnecting wiring between units, accessories, and appurtenances.

2. Interpretation; number, gender. The words "herein" "hereof" and "hereunder" and other words of similar import refer to the Contract as a whole, including all of the Contract Documents, and not to any particular article, paragraph, subparagraph or clause contained in the Contract Documents. Whenever the

context requires, words used in the singular shall be construed to include the plural and vice versa, and pronouns of any gender shall be deemed to include the masculine, feminine and neuter genders.

B. QUOTE SUBMISSION REQUIREMENTS

3. Qualifications of Seller.

a. Each Seller must demonstrate to the satisfaction of the City that it is Responsible, capable of performing the work under the Contract, and has successfully completed contracts equivalent in scope and nature, and comparable in magnitude. Seller must further demonstrate that: 1) it has the necessary financial resources, equipment, and workforce to perform the work under the Contract in a proper and satisfactory manner, in accordance with the Contract Documents, and within the time specified, and 2) that the possible award of this Contract to the Seller will not, in the City's sole discretion, overextend the Seller because it is already performing another City contract or other contract(s) or project(s).

b. As required by Section 17-101, as amended, of The Philadelphia Code, entitled "Prequalification of Prospective Bidders for Contracts for Construction of Public Works", all Sellers shall submit to the Procurement Department through PHLContracts, by the date specified in the Quote advertisement(s), a "City of Philadelphia Prequalification Questionnaire," for the purpose of determining the Seller's Responsibility. Should the Seller omit any required information, or refuse to give any required information, or should the information submitted by Seller, in the judgment of the Procurement Commissioner, taking into consideration the recommendations of the Operating Commissioner, reveal that the Seller is not sufficiently equipped or qualified to enter into or perform the Contract, the City shall not accept any Quote from such Seller(s), and the Procurement Commissioner shall notify the Seller to that effect. In such case, Section 17-101 of The Philadelphia Code shall govern any appeal to which the Seller may be entitled.

4. Examination of Contract Documents and Site.

a. Sellers shall thoroughly acquaint themselves with the Contract Documents, including, without limitation, a careful study and review of the Plans and Technical Specifications. Sellers shall examine in detail the Project site and shall acquaint themselves with conditions affecting the work under the Contract and the overall Project, and, when applicable, the condition of walls and foundations of overlying and adjacent structures, the character of the paving, and the soil and subsurface soil. The Quote shall be prepared with due regard to the provisions of the Contract Documents and to the conditions existing or to be anticipated at the Project site.

b. Where test borings, test piles, and existing underground and above-ground structure locations are reported on, or included with, the Contract Plans or Technical Specifications, or where they are provided as separate Plans or Technical Specifications, they are for the information of the City only and are not provided to Sellers to show the conditions to be encountered by the Seller; the correctness, accuracy, or interpretation of the information is not guaranteed or warranted in any fashion by the City; and in no event is any boring or underground or above-ground structure information to be considered as a part of the Contract, notwithstanding any provision to the contrary that may appear in the Technical Specifications. If a Seller uses any of this information in preparing its Quote, Seller shall assume any and all risks resulting from conditions that differ from the conditions or approximation shown on the Plans or Shop Drawings.

1. If Seller desires to obtain similar data or information, or to conduct an independent subsurface investigation of the Project site, the Seller must notify the Department in writing at least ten (10) days prior to the date for opening of Quotes, or not later than five (5) days after the date on which Quotes are first advertised by the City, whichever date is earlier. Upon written notice from Seller, the City shall afford Seller the opportunity, at Seller's sole expense, to make test borings or soundings, to drive test piles, or to dig test pits on that portion of the Project site in which the work under this Contract will take place. Seller shall be responsible for complying with all Applicable Law relating to such activity. The foregoing notwithstanding, the City reserves the right to reject such investigations by any Seller when the City deems such rejection to be in the City's best interest. If the City permits such investigations by any Seller, then (a) each such Seller, prior to its entry onto the Project site, shall deliver to the City a certificate of insurance conforming to the

requirements of Paragraph 30 below, and a License Agreement in the form provided by the City; (b) each such Seller shall indemnify, defend and hold the City harmless from and against any and all claims, causes of action, suits, damages, losses, costs and expenses, whether for personal injury or property damage or for any other reason, arising out of such Seller's entry on the Project site; (c) such Seller covenants and agrees that it shall restore the Project site to the same condition as existed prior to such Seller's entry onto the Project site; (d) the City reserves the right to require the delivery of payment and performance bonds prior to any entry onto the Project site by such Seller; (e) in the event more than one Seller seeks to conduct such investigations, the City reserves the right to coordinate and schedule such investigations so as to minimize interference with the use of the Project site and other adjacent sites and any interference with other work at the Project site or adjacent to the Project site.

2. Failure of a Seller to notify the Department in writing of a Seller's desire to obtain such information shall operate as an absolute bar to any claim by a Seller that it had no reasonable means of making an independent subsurface investigation of the site.

c. If a Seller discovers or encounters any ambiguity or discrepancy in the Contract Documents in the course of preparing its Quote, the Seller shall promptly notify the Department of the ambiguity or discrepancy prior to the date and time for receipt and opening of Quotes. The City, so advised, may, at its sole discretion determine whether such ambiguity or discrepancy exists and whether any corrective action is necessary.

5. **Antibid-Rigging Act.** All Sellers, by submitting a Quote, certify that they have not committed or engaged in, or attempted to commit or engage in, a prohibited activity under the Antibid-Rigging Act, 62 Pa. C.S.A. § 4501, et seq., as amended, in connection with their Quote. In addition, all Sellers by submitting a Quote certify that the Seller has not been convicted or found liable for any act prohibited by any federal or state law in any jurisdiction involving conspiracy or collusion with respect to bidding on any public contract within the five (5) years prior to the date of the Quote; that the Seller acknowledges that a conviction or finding of liability for any act prohibited by federal or state law in any jurisdiction involving conspiracy or collusion with respect to submitting a Quote on any public contract within the three (3) years prior to the date of the Quote shall not prohibit the City from accepting a Quote from the Seller or awarding a Contract to the Seller, but may nonetheless serve as grounds for Seller's suspension or debarment at the sole discretion of the Procurement Commissioner, or may serve as grounds for a non-award of a Contract to the Seller on the basis of the Seller's lack of Responsibility.

6. **Multiple Quote Restriction.** No Seller shall be a party to more than one (1) Quote for the same Bid Solicitation. A violation of this condition may in the sole discretion of the Procurement Commissioner, result in rejection of any or all such Quotes in which the Seller is interested.

7. **Quote Submission.**

a. By submitting a Quote, the Seller certifies that it is familiar with the Project site and the conditions affecting the Project site, that it has thoroughly reviewed the Contract Documents, and that all work can be completed for the amount stated in the Quote and within the Contract time specified. No Quote may be considered if received after the date and time for opening of Quotes established by the Bid Solicitation, nor may any Quote be modified after that date and time, except as provided herein or by Applicable Law. The time of Quote opening shall be the time displayed in PHLContracts. In the event of any discrepancy between actual time and the time displayed in PHLContracts, the latter shall determine the time of Quote opening.

b. It is the sole responsibility of the Seller to ensure that it has received any and all addenda and the Procurement Commissioner may, in his or her discretion, reject any Quote for which all addenda have not been executed and returned in accordance with the instructions provided therein.

c. For purposes of determining the basis of a contract award, in the event of a discrepancy between a unit price and an extended price for a work or line item, the unit price shall govern, and the extended price shall be re-computed by the City. If the amount set forth as a unit price is ambiguous, unintelligible, or uncertain for any cause, or is omitted entirely, or is the same amount as the extended price for a work or line item, then the amount set forth as the extended price shall govern for purposes of determining the basis of a contract award. In such event, the extended price shall be divided by the estimated quantity for the work or line item to

arrive at a re-computed unit price which shall thereafter govern for purposes of payment under Paragraph 45.

d. Where a unit or other price (including a unit price extension or the aggregate or total price) contained in the Quote contains a mistake or error in computation, or is otherwise ambiguous as to computation, or there is a discrepancy between a unit price and an extended price for a work or line item, and where the mistake, ambiguity, or discrepancy is not discovered prior to contract award and results in the award of a contract to the Seller, which award is later determined to be mistaken or erroneous, or the Contract Amount is determined to be erroneous, based upon a re-computation of the unit prices and the total price, the Contractor shall bear the sole financial risk of such mistake or ambiguity, and such mistake or ambiguity shall be construed solely against the Contractor and in favor of the City. In all such cases of price mistake, ambiguity, or discrepancy, if work under the Contract has not yet commenced, the City shall have the discretion, at its sole option, to formally rescind the Contract, if the Contractor is deemed not to be the low Seller in accordance with the rule set forth in Paragraph 7(c) above, or to unilaterally reform the Contract and the prices therein in accordance with the rule set forth in Paragraph 7(c), if the Contractor would still be deemed to be the low Seller notwithstanding any mistake, ambiguity, or discrepancy. If work under the Contract has already commenced, the City shall have the discretion, at its sole option, to make payment at the unit price as recomputed in accordance with Paragraph 7(c) above or at the mistaken or ambiguous unit price, or to dispute payment at the mistaken or ambiguous price. In the event of a rescission or reformation of the contract under this Paragraph, the Contractor agrees and acknowledges that it shall have no claim against the City, including any claim for breach of contract or breach of any other legal duty, or for lost profits, costs, damages, or expenses of any kind, arising out of the rescission or reformation. In the event that the City disputes payment to the Contractor at a mistaken or ambiguous unit price, and the parties cannot mutually agree upon a price to be paid to the Contractor for the item of work in question, the payment to the Contractor for the item of work shall not exceed the payment which would be made pursuant to Paragraph 51, and the City's liability to the Contractor for such item of work shall not in any event exceed the Contract Amount as specified in Paragraph 44.

8. Quote Withdrawal. P.L. 9, No. 4, Act of January 23, 1974, 73 P.S. § 1601, et seq., as amended, shall govern the withdrawal of Quotes for clerical mistakes. A Seller must provide the Procurement Department written notice of a right to withdraw a Quote under 73 P.S. § 1601, et seq., within two (2) business days after the opening of Quotes.

9. Quote Responsiveness. Subject to the right of the Procurement Commissioner to waive irregularities and non-responsiveness as set forth below in this Paragraph 9, the Contract Documents are mandatory and must be strictly followed by all Sellers in the preparation and submission of their Quotes. After Quotes are opened, the Procurement Department, and other City departments or agencies where appropriate or specified, shall review all Quotes for responsiveness. Any Quote which is incomplete, obscure, conditional, unbalanced, which contains additions not called for, or irregularities of any kind, including alterations or erasures, or which fails to conform in any respect to the Contract Documents shall be deemed to be non-responsive and shall be rejected, except where the Procurement Commissioner, in his or her sole discretion, determines that the irregularity or non-responsiveness is not material or that a waiver of the irregularity or non-responsiveness is otherwise permitted by the Contract Documents or by Applicable Law. The Procurement Commissioner reserves the right to waive such irregularities or non-responsive matters in a Quote. The Procurement Department's determination of non-responsiveness shall be final and any Quote rejected as non-responsive shall not be eligible for Contract award. The Procurement Commissioner's determination of non-responsiveness is not appealable to the Court of Common Pleas.

10. Security for Execution of Contract. The Seller shall include with its Quote a bid bond in the amount of ten percent (10%) of the gross amount of the Quote. The gross amount of the Quote shall mean the sum of all items enumerated in the Quote, without reduction for "deduct" alternates. All Sellers must use the City's standard bid bond form, which is included in the Bid Solicitation or otherwise available at the City's Procurement Information Center (Rm. 170 Municipal Services Bldg.), in fulfilling the requirement of this Paragraph 10. The City shall not accept any other bid bond form. The Seller may not submit cash. Upon return of the duly executed Contract Documents by the lowest responsible Seller to the City's Law Department, the bid bonds of all Sellers shall be deemed released.

11. Bid Processing Fee.

a. In addition to bid security and any other fee or monies required, the Quote shall be accompanied by a non-refundable processing fee in the form of a separate check payable to the City or electronic payment as specified in the bid solicitation. The processing fee is based on the advertised cost estimate for the bid in accordance with the formula below. Cash is not acceptable.

\$0	when the advertised cost estimate does not exceed \$10,000
\$10	when the advertised cost estimate is or exceeds \$10,000 but does not exceed \$100,000
\$30	when the advertised cost estimate is or exceeds \$100,000 but does not exceed \$300,000
\$50	when the advertised cost estimate is or exceeds \$300,000 but does not exceed \$500,000
\$100	when the advertised cost estimate is or exceeds \$500,000 but does not exceed \$1,000,000
\$200	when the advertised cost estimate is or exceeds \$1,000,000 but does not exceed \$2,000,000
\$300	when the advertised cost estimate is or exceeds \$2,000,000 but does not exceed \$3,000,000
\$400	when the advertised cost estimate is or exceeds \$3,000,000 but does not exceed \$4,000,000
\$500	when the advertised cost estimate is or exceeds \$4,000,000 but does not exceed \$5,000,000
\$600	when the advertised cost estimate is or exceeds \$5,000,000.

b. For the purpose of estimating the amount of the bid processing fee the amount of work and labor or the quantities of materials or supplies to be furnished will be in accordance with the estimated quantities, but the City will not be bound by such estimates in regard to the actual quantities of work and labor or materials or supplies required to be furnished under the Contract.

c. Failure to submit the bid processing fee may result in the Seller's disqualification from submitting a Quote. In addition, if an award is made pursuant to the Bid Solicitation and Quote, any unpaid processing fees owed by the Seller to the City must be paid prior to the City's release of any payments to the Contractor under the Contract.

12. Business Tax Requirements. Any Contractor, or vendor of goods, wares and merchandise, or purveyor of services, who submits a Quote and is awarded a contract by the City or the School District of Philadelphia ("School District" or "SDP"), is subject to Philadelphia's business tax and applicable ordinances and regulations. Anyone who is awarded a contract by the City or the School District of Philadelphia pursuant to a formal bid solicitation, including a Bid Solicitation, shall be deemed to have entered into a contract within the City, and the subsequent delivery of goods into the City, or performance of services within the City constitutes "doing business" in the City and subjects the successful Seller to one or more of the following taxes: (a) Business Privilege Tax; (b) Net Profits Tax; and (c) City Wage Tax. The successful Seller, if not already paying the aforesaid taxes, is required to apply to the Department of Revenue for a tax identification number and to file appropriate business tax returns as provided by law.

13. Tax Indebtedness. The successful Seller shall represent, warrant and covenant that the Contractor and any entities controlling the Contractor, under common control with the Contractor, or controlled by the Contractor are not currently indebted to the City, and will not at any time during the term of the Contract be indebted to the City, and will not at any time during the term of this Contract (including any extensions or renewals thereof) be indebted to the City, for or on account of any delinquent taxes (including, but not limited to, taxes collected by the City on behalf of the School District of Philadelphia), liens, judgments, fees or other debts for which no written agreement or payment plan satisfactory to the City has been established. In addition to any other rights or remedies available to the City at law or in equity, the Contractor acknowledges that any breach or failure to conform to this representation, warranty and covenant may, at the option of the City, result in the withholding of payments otherwise due to the Contractor and, if such breach or failure is not resolved to the City's satisfaction within a reasonable time period specified by the City in writing, may result in the offset of any such indebtedness against said payments or the termination of this Contract for default (in which case the Contractor shall be liable for all excess costs and other damages resulting from the termination), or both.

14. Commercial Activity License. A Commercial Activity License ("CAL") is required for every Person desiring to engage in any business within the City, whether or not such Person maintains a place of business in the City. The successful Seller will be required to furnish a CAL number at the time of Contract

award, but no later than before the "Notice to Proceed" is issued. In the event the successful Seller has applied for, but not been issued, a CAL, a photocopy of the application will be acceptable. The CAL is a one-time license with no expiration date. Only one (1) license is needed for multiple locations or for multiple businesses for the same Person. If the Seller has never had a CAL assigned, the Seller may request one by filing a "Miscellaneous License Application". In order to be assigned a CAL, it is necessary to have a "Philadelphia Business Tax Account Number". This is a number assigned by the City's Department of Revenue to identify City tax accounts. If the Seller has never had a number assigned, the Seller may request one by filing an "Application for Philadelphia Business Tax Account Number". Any tax account previously opened for the Seller which is unsettled or delinquent will cause delay and may preclude the issuance of a new license. Applications may be obtained from the Department of Licenses and Inspection, License Issuance Unit.

15. Comparison of Quotes. Quotes will be compared on the basis of the aggregate of all the items of the Quote, unless otherwise specified in the General Bidding and Contract Requirements.

16. Award of Contract. The City shall make the Contract award to the lowest responsive, Responsible Seller. In the event of an absolute tie, the Procurement Commissioner shall make the Contract award in accordance with the best interests of the City. The Procurement Commissioner, in his or her sole discretion, may reject all Quotes, if deemed in the best interests of the City. The award of the Contract shall be governed in all respects by 62 Pa.C.S. §3911, as amended. However, the failure of the City to comply with the statutory requirement set forth in 62 Pa.C.S. §3911 shall not operate as a release of the Seller, unless the Seller shall first notify the City in writing, prior to the end of the deadline set forth in 62 Pa.C.S. §3911, of the Seller's intent to demand compliance of the City with such requirement.

17. Binding Contract and Execution of the Contract.

a. The award shall not become a contract binding upon the City until after written Notice of Contract Award is made by the Procurement Department to the lowest responsive, Responsible Seller and until after all of the following conditions have been satisfied:

1. Successful Seller posts a proper performance bond and a proper payment bond, as provided for in Paragraph 18 below, on the City's current bond forms, within the time set forth in the Notice of Contract Award;
2. Successful Seller provides proof of the requisite insurance;
3. The Contract is approved as to form by the City's Law Department;
4. The Director of Finance and the City Controller's Office certify the availability of funds for the Contract; and
5. The Procurement Commissioner executes the Contract.

The Procurement Commissioner may, in his or her sole discretion, cancel any contract award if any of the above conditions are not satisfied, or if the Procurement Commissioner, in his or her sole discretion, determines cancellation of the contract award to be in the best interests of the City. In the event of such cancellation, the successful Seller agrees and acknowledges that it shall have no claim against the City, including any claim for breach of contract or breach of any other legal duty, or for lost profits, costs, damages, or expenses of any kind.

b. The execution of the Contract shall be made within sixty (60) days of the date of the award of the Contract and shall in any event be governed in all respects by 62 Pa.C.S. §3912, as amended. Any Seller who is not lawfully released from its Quote and who fails, refuses, or is unable to furnish the required performance and payment bonds or insurance, shall be liable to the City for the actual loss or damage sustained by the City as a result of the failure of the Seller to enter into the Contract. This remedy against the Seller shall be in addition to, and not in lieu of, any remedy or claim which the City may have under the bid bond posted by the Seller.

c. In no event shall the Contract awarded to the Contractor be construed or deemed to include, as a term, covenant or condition, any exception, addition or other term which the Seller may have included or as part of its Quote, except as may be expressly approved by the Procurement Commissioner pursuant to Paragraph 9 above.

18. Contract Surety. As provided by the Act of 1967, December 20, P.L. 869 (8 P.S. § 193.1, *et seq.*, as amended), the successful Seller will be required at the time of execution of the Contract to give security for the faithful performance of the work and for compliance with the Contract in the form of a performance bond, with a surety company approved by the City, in a sum equal to 100% of the amount of the Contract (equal to the Quote amount plus any contingency amount). In addition, as provided by the Act of 1967, December 20, P.L. 869 (8 P.S. § 193.1, as amended), the Contractor will be required at the time of execution of the Contract to give a payment bond, with a surety company approved by the City, in a sum one hundred percent (100%) of the amount of the Contract (equal to the Quote amount plus any contingency amount), conditioned for the full payment of Subcontractors and others furnishing labor and materials in the performance of the Contract. Both the performance and payment bonds must be submitted by the Seller to the City on bond forms provided by the City.

C. GENERAL REQUIREMENTS OF THE CONTRACT

19. Unauthorized Acts. Any act of any City representative, official, agent, or employee, which is not within the scope of his or her authority as set forth in the Contract Documents or pursuant to the Philadelphia Home Rule Charter, shall not be binding on the City and shall not be deemed as a defense to the Contractor for the breach of any of the terms and conditions of the Contract.

20. Cancellation of the Contract. The Contractor will not be required to proceed with the work of the Contract, if:

- a. for any reason for which the Contractor it is not responsible, the Contractor cannot commence work within three (3) months from the date of execution of the Contract, except in the case of Contracts for street improvements, when six (6) months shall be the limiting period; or
- b. at any time prior to the issuance of the Notice to Proceed, the City, in its sole discretion, determines that it must reduce the scope of the work in an amount equal to or greater than twenty-five percent (25%) of the amount of the Quote. In such event, the City shall give notice thereof the Contractor.

In the event the Contractor cannot commence work, the Contractor shall give notice of cancellation within five (5) days after the date which is three (3) months from the date of execution of the Contract by the Contractor, except in the case of Contracts for street improvements, when the Contractor shall give such notice six (6) months from the date of execution of the Contract by the Contractor. In the event the City gives notice to the Contractor that the City has determined to reduce the scope of the work as provided in Paragraph 20(b) above, then the Contractor shall give notice of cancellation within five (5) days after the date the Contractor receives such notice from the City, otherwise the Contract shall remain valid.

This Paragraph 20 shall not apply to Contracts entered into for work the commencement of which is dependent upon progress of other contracts where this condition is plainly indicated by the character and location of such work at the time the City issues the Bid Solicitation and where Departmental constraints limit construction activities as described in the Technical Specifications. The City shall have no liability, by way of any penalty or otherwise, arising out of the cancellation of the Contract pursuant to this Paragraph 20.

21. Termination for the Convenience of the City. The City may terminate this Contract at any time during the term of the Contract, for any reason, including, without limitation, the City's own convenience. Written notice of termination shall be sent to the Contractor by the Procurement Commissioner and said notice shall set forth the effective date of the termination. Upon receipt of such notice of termination, the Contractor shall stop all work under the Contract. Upon termination under this Paragraph, the City shall be liable to the Contractor only for the cost and profit on the physical work then completed on the job site by the Contractor

and in place. The City shall have no additional liability or cost for termination of the Contract, including, but not limited to, any penalty, the Contractor's anticipated profits, the Contractor's estimating costs, or any loss on the work terminated. If termination of the Contract occurs prior to the issuance of the Notice to Proceed, the City shall not be liable to the Contractor for any cost or lost profits of the Contractor, regardless of whether the Contractor may have performed some physical work, except where the Project Manager has otherwise authorized in writing the commencement of work by the Contractor, in which case the City's liability to the Contractor shall be governed by the prior terms of this Paragraph. Termination of the Contract shall not affect any obligation or liabilities of either Party accruing prior to termination.

22. Contractor's Obligations. The work to be done under the Contract is set forth in detail in the Contract Documents. The Contractor shall furnish all labor, materials, plant, tools and appliances, and shall complete the work to the satisfaction of the Project Manager in the manner and within the time required in the Contract Documents at the prices set forth in the Contract. If at any time the Contractor's methods, workforce, or equipment appear to the Project Manager to be unsafe, insufficient, or inadequate for the proper performance of the provisions of the Contract, the Project Manager may order the Contractor to make such changes as the Project Manager may deem necessary, and the Contractor shall comply with such orders, but the failure of the Project Manager to make such demands shall not relieve the Contractor of its obligations under the Contract. The Contractor shall maintain an office on the Project site where orders and instructions may be delivered, and shall give personal attention to the faithful performance of the work of the Contract. The Contractor shall employ a competent representative or superintendent on the Project site who shall have full authority to receive and execute orders, and to supply such labor, tools, and materials as may be required for the proper performance of the work.

23. Performance of Work by the Contractor. The Contractor is required to perform, on the site and with its own work force, work with a value of at least twenty percent (20%) of the original total contract price, exclusive of profit, overhead and the costs of procuring insurance and bonds. The Contractor shall submit with its Quote a complete description of the work it will perform (e.g., earthwork, paving, brickwork, roofing, etc.), the percentage of the total work this represents, and the estimated dollar value thereof.

24. Materials and Equipment Loaned or Rented by the City. Any materials, or equipment loaned or rented by the City to the Contractor for use on the particular job must be returned by the Contractor in kind or in cash, or as a credit to the Contract as determined by the Department or the Contractor will be considered in default of the Contract. The use or operation of such material or equipment shall be at the Contractor's own risk. The material or equipment shall be taken in its "AS IS" condition and the Contractor shall maintain the material or equipment in the same condition as when received, less normal wear and tear. Should damage occur, repair or replacement shall be made by the Contractor at its own expense, at the election and to the satisfaction of the City, in accordance with specifications approved in writing by the City.

25. Contract Time.

a. Times set forth in the Contract Documents for the performance of the work or any portions thereof are essential elements of the Contract. The Contractor shall begin work within ten (10) days from the date of issuance of the Notice to Proceed from the Department directing the Contractor to proceed with the work, and shall complete all work covered by the Contract Documents within the time specified in the General Bidding and Contract Requirements. The Contract completion date shall be determined by reference to the date of the issuance to the Contractor of the Notice to Proceed. In submitting a Quote, the Contractor acknowledges and agrees that the Contract time, as specified in the General Bidding and Contract Requirements, is a reasonable period for performing the work.

b. Except as may otherwise be required by the General Bidding and Contract Requirements or the Technical Specifications, the Contractor shall prepare and submit to the Project Manager, before starting work, a written and detailed construction schedule which shall, at a minimum, indicate the milestone dates on which the Contractor intends to start and end each of the principal items of work under the Contract and which shall indicate generally how the Contractor intends to complete the work under the Contract within the Contract time specified. The Contractor's construction schedule shall include a schedule or timeline for submission of Shop Drawings or other submittals to the Department, which shall be coordinated with the overall construction schedule and which allows for a reasonable time for the Department or the Project Manager to review the

submittals or such time as the Department or the Project Manager may otherwise require pursuant to any of the Contract Documents. The Contractor's construction schedule shall in no event exceed the time allotted for completion of the Contract. From time to time, the Contractor shall revise and update its construction schedule to show changes to the schedule and any agreed revisions to the Contract time. The Contractor acknowledges that its failure to submit a written schedule to the Project Manager, as herein provided, shall preclude the assertion of any claims for delay or interference to Contractor's schedule or prosecution of the work and shall further preclude the assertion of any claim or request for an extension of the Contract time.

c. The Contractor shall be entitled to a reasonable extension of time for unavoidable delays or interference in completion of the Contract caused by:

1. Any acts or omissions of the City (but not PGW, or its contractors, or any other non-City utilities or authorities) which occur subsequent to the issuance of the Notice to Proceed and which cause delay in the completion of the Contract, by failure to give possession of the Project site, by changes in the Plans and Technical Specifications, or by requiring for any cause the suspension of the work under the Contract, except where such suspension is the result of a default or other act or omission by the Contractor. Any delay or postponement in the issuance of the Notice to Proceed shall not entitle the Contractor to an extension of the Contract time and shall not give rise to any claim for delay, disruption, or interference by the Contractor. The Contractor's remedies in the event of a delay or postponement in the issuance of the Notice to Proceed shall be governed solely by 62 Pa.C.S. §3913, as amended.

2. Causes not reasonably foreseeable by the Parties at the time of the complete execution of the Contract and which are entirely beyond the control and without the fault or negligence of the Contractor, including, but not limited to, acts of God, acts of the public enemy, acts of governmental authorities, quarantine restrictions, general strikes throughout the trade or freight embargoes not caused or participated in by the Contractor, fire, floods, pandemics and weather of unusual severity, such as hurricanes or tornadoes.

d. Delays caused by the Contractor's Subcontractors or materialmen shall not, in themselves, be cause for an extension of time by the City. To warrant an extension of time, such delays must be occasioned by the same causes specified in Paragraphs 25(c)(1) and (2) above.

e. Time extensions shall be handled as follows:

1. The Contractor, within five (5) days after the beginning of any delay or interference to its construction schedule, shall notify the Project Manager in writing of the occurrence of the delay or interference, stating with reasonable particularity the cause or causes of the delay or interference and the Contractor's intention to seek an extension of time.

2. Any claim by the Contractor for a time extension must be made in writing to the Project Manager within ten (10) days after the conclusion of the delay or interference for which a time extension is requested or the City will not consider such claim. The City shall not in any event grant a time extension for any delay or interference which was incurred more than five (5) days before the Contractor gave written notice as required in subparagraph (1) above.

3. Before the Project Manager reviews a claim for a time extension, the Contractor shall demonstrate in writing the effect of the delay or interference on the Contractor's construction schedule, including plotting such effect on the Contractor's critical path documents, showing graphically therein the effect on the Contract completion date, both in calendar days and Working Days. This depiction of the delay or interference must accompany the written claim for a time extension submitted in accordance with subparagraph (2) above. If the Contractor believes that it has been impacted beyond a mere time delay, the Contractor shall also provide the Project Manager with an estimate of the costs incurred by the Contractor as a result of the delay or interference. The failure of the Contractor to provide the Project Manager with this contemporaneous cost estimate shall bar any later claim by the Contractor for any costs incurred as a result of the delay or interference.

4. If the Project Manager determines that an extension of time is in order, the time allowed for any delay will be added to and will correspondingly extend the Contract time for completion and

adjust any Contract completion milestones set forth in the General Bidding and Contract Requirements or the Technical Specifications. The Contractor agrees that a time extension granted by the Project Manager shall be its sole remedy for a delay or interference and shall operate as a full and complete release of any claim by Contractor for any and all costs and expenses related to or arising out of the event giving rise to the delay or interference.

f. NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED HEREIN, THE CONTRACTOR AGREES AND ACKNOWLEDGES THAT THERE SHALL BE NO PAYMENT OR COMPENSATION OF ANY KIND TO THE CONTRACTOR FOR DAMAGES OR COSTS ARISING FROM ANY DELAY OR INTERFERENCE WHETHER SUCH DELAY IS AVOIDABLE OR UNAVOIDABLE. CONTRACTOR FURTHER AGREES AND ACKNOWLEDGES THAT ITS SOLE REMEDY IN THE CASE OF DELAYS OR INTERFERENCES TO ITS CONSTRUCTION SCHEDULE WHICH ARE ATTRIBUTABLE TO THE CITY, SHALL BE A REASONABLE EXTENSION OF THE CONTRACT TIME.

g. On contracts on a calendar day basis (a specified number of days), no allowance will be made for Saturdays, Sundays or holidays. On contracts on a Working Day basis, allowances will be made for days or parts of days, in increments of one-quarter (1/4) day, for conditions entirely beyond the control of the Contractor; New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, or the Monday thereafter when these days occur on Sunday, and Saturdays and Sundays shall not be considered as Working Days. The Department shall keep a record of the Working Days and the Department shall make this record available to the Contractor on request. The Contract time shall start with the first Working Day after the date of the Notice to Proceed and the scheduled date of completion shall be that established by the specified number of Working Days plus the allowance.

h. If, for reasons other than those stated above, any portion of the work remains uncompleted after the Contract date specified for its completion, notwithstanding Substantial Completion of the work, the Project Manager shall deduct from payments due the Contractor, as liquidated damages an amount per diem, according to the following schedule:

<u>Contract Value</u>	<u>Agreed Delay Damages Per Diem</u>
\$0-\$100,000	\$ 250
\$100,001-\$500,000	\$ 500
\$500,001-\$1,000,000	\$ 750
Over \$1,000,000	\$1,000

These per diem delay damages are assessed as agreed liquidated damages because the Parties have considered the difficulty of determining the City's actual damages and agreed that computation of the City's actual damages is impossible. If a delay is due to causes which the Contractor considers extraordinary or beyond its control, the Contractor must give timely notice thereof in writing as specified in Paragraph 25(e) above. In the event that the General Bidding and Contract Requirements or the Technical Specifications contain a provision allowing for the imposition of liquidated damages for delays to the completion of the work, such provision shall take precedence over this subparagraph (h).

This subparagraph (h) shall not be construed to apply to claims, offsets, credit change orders, and/or chargebacks which the City may assert or assess against any Contractor for the reimbursement or recovery of any costs incurred by a different Contractor on the Project due to the fault or delay of the Contractor. In all such cases, the City shall not be limited to the per diem amounts listed above and shall be permitted to seek recovery or reimbursement of the full amounts incurred by any non-delaying Contractor.

26. Independent Contractor. The Contractor is an independent contractor and shall not in any way or for any purpose be deemed or intended to be an employee or agent of the City. Neither the Contractor nor its employees or Subcontractors shall in any way represent that they are acting as employees, officials or agents of the City.

27. **Risk of Loss.** The Contractor shall assume all risk and responsibility for casualties of every description in connection with its work. The Contractor shall have charge of the entire work until completion and acceptance, and shall alone be liable and responsible for any injuries to persons and any loss or damage to property, buildings, or adjacent work that may occur as a consequence of or during the progress of the work under this Contract, whether such damage or accident be due to the Contractor's own negligence or that of its servants, agents, employees, or whether such damage or accident be due to the inherent nature of the work, or whether such damage or accident be due to other causes.

28. **Indemnification.** The Contractor shall indemnify, defend and hold harmless the City, its officers, employees, and agents, from and against any and all losses, costs and expenses, including but not limited to litigation costs, settlement fees and expenses, and counsel fees and expenses, claims, suits, actions, damages, liability and expenses, arising out of or resulting in whole or in part from the performance of the work under the Contract, including, but not limited to, those in connection with loss of life, bodily injury, personal injury, damage to property, contamination or adverse effects on the environment, intentional acts, failure to maintain a drug-free work site and workforce and any other breach of the Contract, regardless of the inherent nature of the work and regardless of whether or not such loss, cost, claim, suit, action, damage, liability, or expense is caused in whole or in part by the negligent act or omission of a party indemnified hereunder. Such obligation shall not be construed to negate, abridge or reduce other rights or obligations of indemnity which would otherwise exist as to a Party or Person described in this Paragraph. The Contractor shall further indemnify, defend and hold harmless the City from and against any and all claims, demands, liens, causes of action, liabilities and judgments of any kind asserted against the City by any Subcontractor or suppliers on account of or relating to the furnishing of services, work, labor, materials or equipment under the Contract for the Contractor.

In claims against any Person indemnified under this Paragraph 28 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Paragraph 28 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers compensation acts, disability benefit acts or other employee benefit acts.

29. **Assignment.** Except through a Subcontract, the Contractor shall not assign the Contract, or any part of the Contract, or delegate performance of the Contract (other than to its own work forces), without obtaining the prior written consent of the Procurement Commissioner and Operating Commissioner. The decision whether to consent to an assignment, the timing of consent (if any), and conditions to such consent, if any, shall each be at the City's sole discretion. Any consent to the assignment of any monies to be paid under the Contract shall not relieve the Contractor from the faithful performance of any of its obligations under the Contract or change any of the terms and conditions of the Contract. Any purported assignment in violation of this provision shall be void and of no effect. The City's consent to an assignment shall not release the assignor from any liability accrued or thereafter accruing under the Contract. Any assignment or purported assignment shall be in writing and shall contain an express assumption by the assignee of all liability accrued or thereafter accruing under the Contract. Consent by the City to any assignment shall not be deemed a course of conduct, dealing or performance with respect to any other assignment or proposed assignment. For purposes of this Paragraph 29, an assignment includes the transfer or acquisition of the Seller or the Contractor, or a controlling interest therein, through a corporate or other merger, and the appointment of a receiver or bankruptcy trustee, and the transfer of the Contract or the Contractor in any bankruptcy or other insolvency proceeding.

30. **Insurance.** Unless otherwise approved by the City's Risk Manager in writing, the Contractor shall, at its sole cost and expense, procure and maintain, or cause to be procured and maintained, in full force and effect until the Contractor completes the work under the Contract, the types and minimum limits of insurance specified below, covering the Contractor's performance of the work required under the Contract. The Contractor shall procure, or cause to be procured, all insurance from reputable insurers admitted to do business on a direct basis in the Commonwealth or otherwise acceptable to the City. All insurance herein, except Professional Liability insurance, shall be written on an "occurrence" basis and not a "claims-made" basis. In no event shall the Contractor perform any work under the Contract until the Contractor has delivered or caused to be delivered to the City's Office of Risk Management the required evidence of insurance coverages. If the Contractor fails to obtain or maintain the required insurance, the City shall have the right to treat such failure as a default under

the Contract and to exercise all appropriate rights and remedies. All insurance coverages shall provide for at least thirty (30) days prior written notice to be given to the City in the event coverage is materially changed, cancelled, or non-renewed. The City, its officers, employees, and agents, shall be named as additional insureds on the General Liability Insurance policy and, where applicable, the Builders Risk Insurance Policy. The Contractor shall also deliver or cause to be delivered to the City an endorsement stating that the coverage afforded the City and its officers, employees and agents, as additional insureds, will be primary to any other coverage available to them and that no act or omission of the City, its officers, employees or agents shall invalidate the coverage.

a. Workers' Compensation and Employers' Liability.

1. Workers' Compensation: Statutory limits
2. Employers' Liability: \$100,000 Each Accident – Bodily Injury by Accident; \$100,000 Each Employee – Bodily Injury by Disease; and \$500,000 Policy Limit – Bodily Injury by Disease.
3. Other states insurance including Pennsylvania.

b. Commercial General Liability Insurance.

1. Limit of liability: \$1,000,000 per occurrence combined single limit for bodily injury (including death) and property damage liability; \$1,000,000 advertising injury; \$2,000,000 general aggregate, and \$1,000,000 aggregate for products and completed operations. The City may require higher limits of liability if, in the City's sole discretion, the potential risk warrants.
2. Coverage: Premises operations; Blanket Contractual liability; Personal injury liability; Products and completed operations; Independent Contractors; Employees and volunteers as additional insureds; Cross liability; Broad form property damage (including completed operations); Explosion, collapse and underground hazards; and asbestos abatement liability Coverage (Note: Required for asbestos abatement projects only).

c. Automobile Liability.

1. Limit of Liability: \$1,000,000 per occurrence combined single limit for bodily injury (including death) and property damage liability.
2. Coverage: Owned, non-owned and hired vehicles.

d. Builders' Risk/Installation Floater Insurance.

1. When required: This insurance is required only when the total Contract price is \$500,000 or greater (Note: not for road and street work, unless required in the Supplementary Conditions, Technical Specifications, Standard Details and Specifications, and/or General Bidding and Contract Requirements).
2. Coverage: "All risks" in an amount equal to not less than the full replacement cost of the work under the Contract (meaning work in replacement which is of like kind and quality).
3. Period of Coverage: Anything herein to the contrary notwithstanding, the Builders' Risk Insurance shall be procured and maintained during the entire period of performance of the Contract until final acceptance of the work by the City.

Certificates of insurance evidencing the required coverages and additional insured endorsements must specifically reference the City contract Number for which they are being submitted. The original certificates of insurance shall be submitted to the Department and the Office of Risk Management at least ten (10) days before work is to commence and at least ten (10) days before each renewal date. The ten (10) day requirement for advance documentation of insurance coverage may be waived in situations where such waiver will benefit the City, but under no circumstances shall the Contractor actually begin work (or continue work, in the case of renewal) without providing the required proof of insurance and required endorsements. The City reserves the right to require the Contractor to furnish certified copies of the original policies of all insurance required under this Contract, including certified copies of all required endorsements, at any time upon ten (10) days prior written notice to the Contractor.

31. Proprietary Rights Indemnity. The Contractor shall indemnify, defend and hold harmless the City, and its officers, employees, and agents, from and against any and all losses, costs and expenses, including, but not limited to, litigation costs, settlement fees and expenses, and counsel fees and expenses, claims, suits, actions, damages, liability and expenses for or on account of the use of patented appliances, products, processes, constructions, designs, or methods, or the infringement of any patent, trademark, service mark, copyright, or trade secret rights of any third party, and the Contractor shall pay all royalties, charges and penalties which may become due or payable by reason of such use or infringement. Before the issuance of the Final Estimate, upon request by the Project Manager, the Operating Commissioner, or the Procurement Commissioner, the Contractor shall submit evidence of the full payment of such royalties, charges and penalties, or in lieu thereof, Contractor shall give such security, approved by the City Solicitor, as may in the opinion of the Project Manager, the Operating Commissioner, or the Procurement Commissioner, be necessary to indemnify, defend and hold harmless the City, its officers, employees, and agents, as aforesaid.

32. Default and Remedies.

a. It shall be a violation of the Contract for the Contractor to abandon the work under the Contract; to fail or refuse to prosecute the work with promptness and diligence; to unreasonably delay the work so that it may not be completed within the contract time; to fail or refuse to proceed with work under a Disputed Change Order; to fail or refuse to furnish suitable materials in place of any which may be rejected by the Project Manager as unsuitable as not being in accordance with the Contract Documents, or to refuse or neglect to furnish and supply a sufficient number of properly skilled workers and necessary equipment or either of them; to execute any of the work improperly, carelessly, or in bad faith; to fail or refuse to remove any of the work which, in the opinion of the Project Manager, is defective and unsuitable and not in accordance with the Contract Documents, and to replace it with work that is in accordance with the Contract Documents; to cause or permit to occur an Event of Insolvency with respect to the Contractor; or to otherwise violate any of the terms, conditions, and provisions of the Contract. In the event of a violation of Contract, the Operating Commissioner may notify the Contractor and its surety in writing to require that each remedy the Contractor's violation of the Contract and require the Contractor to comply with the terms, conditions, and provisions of the Contract which it has violated or is violating. The failure of the City to promptly notify the Contractor of a violation of Contract shall not constitute an acceptance by the City of work which is performed or installed in violation of the Contract.

b. If the Contractor shall fail to cure or remedy, or diligently commence to cure or remedy, the violation of the Contract, as described in the notice specified above, within five (5) days after the receipt of said notice, or within twenty four (24) hours after receipt of said notice when, in the opinion of the Operating Commissioner, immediate action is necessary to safeguard life or property, or within some other period of time specified in the notice, the Operating Commissioner shall thereupon notify the Procurement Commissioner, who shall have the right to declare the Contractor in default of the Contract, and to notify the Contractor to discontinue the work or any part thereof under the Contract, and to call upon the surety to carry out its obligations under the performance bond posted for the Contract.

c. If the surety fails to abide by the terms of the performance bond or if the surety shall deny liability to the City under the performance bond, the Procurement Commissioner shall have the right to declare the surety in default under the performance bond and, at his or her sole option, shall also have the right:

1. To terminate the work under the Contract, to maintain conditions, to obtain Quotes (if circumstances will allow) for all or any portion of the work, and to enter into a new contract to complete the work of the original Contract; or

2. In case of an emergency, including, but not limited to, danger to life or property, or serious interference with traffic, to terminate any and all of the work under the Contract, and to then and there secure in the open market, from any Person, at the then current market prices the materials of the quality and quantity required, the necessary workers and mechanics, and the required equipment to complete the Contract.

d. Upon default by the Contractor as herein set forth, all moneys due and owing to the Contractor upon estimates, retainage, or otherwise, materials delivered, materials built into the work, and the Contractor's plant (including tools, appliances, and equipment on the premises intended for use in the performance of the Contract), shall become the property of the City for use in the completion of the work under the Contract, and the City shall have resort thereto to the extent necessary to maintain and complete the work and reimburse the City for its outlays and expenditures.

e. In case of such default by the Contractor the remedies herein provided shall be in addition to and not in substitution of the rights and remedies which would otherwise be vested in the City by statute, at law or in equity, all of which rights and remedies are specifically reserved to the City. In addition, upon default by the Contractor, the Procurement Commissioner shall have the right to secure from any Person the materials, equipment, and labor necessary and required for the proper completion of the Contract. In such event, the Contractor shall pay the City, upon demand, the difference between the cost paid by the City for such materials, equipment and labor and the price or prices set forth in the Contract, together with all costs and expenses incident to the same and incurred by the City. Upon default by the Contractor, the Procurement Commissioner, in his or her sole discretion, shall also have the right, to terminate the Contract and to secure from any Person the materials, equipment, and labor necessary and required for the proper completion of the work. In such event, the Contractor shall pay the City, upon demand, the difference between the price or prices set forth in the Contract and the price or prices which may be paid upon such termination and completion of the work, together with all costs and expenses incident to such re-advertisement. In the exercise of either of these remedies, the City shall further have the right to a set-off against any monies which may be due or may thereafter become due the Contractor under the Contract or any other contract between the City and the Contractor. If the Procurement Commissioner shall secure materials, equipment, and labor to complete the work under the Contract, or if the Procurement Commissioner shall terminate this Contract, the Procurement Commissioner shall have the right to take possession, for the purpose of completing the work under the Contract, of all materials, tools, appliances, and equipment on the Project site, intended for use in the performance of the Contract. The Contractor hereby assigns to the City (and each Subcontract shall require each Subcontractor to assign) all right, title, and interest of the Contractor in and to such materials, tools, appliances, and equipment. The failure of the City to exercise any of the remedies herein provided shall not preclude the resort by the City to any other remedy available to the City arising out of the Contractor's default.

f. The use of any specific remedy herein provided shall not bar subsequent or concurrent resort to any other remedy available to the City at law or in equity, for the recovery of damages or otherwise, on account of such default, or in the event of any other default by the Contractor.

g. The Contractor and its surety shall pay to the City on demand, all loss, expense, cost or damage suffered or incurred by the City by reason of any default.

33. Subcontracts. Within fifteen (15) days after execution of the Contract, the Contractor shall submit in writing to the Project Manager the names of all Subcontractors who will perform any work on the Contract or who will supply any materials or equipment for the Contract. All proposed Subcontractors who have not been pre-approved by the Department may be approved by the Project Manager if in his or her opinion such proposed Subcontractor is reliable, Responsible and competent to perform the work in compliance with the Contract Documents. The City, acting in its sole discretion, reserves the right to reject any Subcontractor. The City shall have no liability to the Contractor for additional compensation under the Contract, or otherwise, in connection with the substitution of a Subcontractor for any proposed subcontractor rejected by the City pursuant to this Paragraph 33. The Contractor shall be as fully responsible to the City for the acts and omissions of its

Subcontractors and Persons either directly or indirectly employed by them, as it is for the acts and omissions of the Contractor and Persons directly or indirectly employed by the Contractor. The City and the Contractor specifically understand and intend, and acknowledge and agree that no Subcontractor utilized by the Contractor shall have any right or claim against the City or the Department to any monies due and owing to the Contractor for the performance of work under the Contract. Each Subcontract for any portion of the work is hereby assigned to the City provided that (a) such assignment is effective only after termination of the Contract by the City and only for a Subcontract which the City, acting in its sole discretion, accepts by issuing notice to such Subcontractor and to the Contractor; and (b) such assignment, if exercised, is subject to the prior rights of the surety, if any, obligated under a bond relating to this Contract. The exercise of the foregoing option for an assignment shall be in the City's sole discretion, the City having no duty or obligation to the Contractor, such Subcontractor or any surety, to exercise or decline to exercise the foregoing option for an assignment. The Contractor shall incorporate the foregoing option for an assignment into each Subcontract for any portion of the work.

34. Permits and Licenses. Unless otherwise noted elsewhere, the Contractor shall obtain all permits and licenses required by the City or pursuant to Applicable Law in connection with the performance of all or any part of the work under the Contract, unless otherwise specifically directed. The Contractor will be required to pay the current fee for such permits and licenses required in connection with all or any portion of the work under the Contract, including any permits and licenses required in connection with any equipment, system or component forming part of the work.

35. Co-operation and Coordination with other Contractors.

a. The Contractor shall have the duty to co-operate and coordinate with any other contractors on other work which is being performed concurrently on or adjacent to the Project site, including specifically PGW, or its contractors or any other non-City utilities or authorities, and shall afford reasonable facilities and access to them. The Project Manager will decide any matters in dispute as to the performance of the work, including access to the Project site and priority of performance on either side of any division line between contiguous sections of the Project site where the Contractor and another contractor each work.

b. Where the work or any portion thereof is performed by the Contractor as part of a "multiple-prime" project, or in conjunction or combination with other "prime" contractors, the Contractor shall have the duty to cooperate and coordinate its work with the work of each of the other prime contractors. The Contractor shall further have a duty not to delay, disrupt, interfere with, or otherwise retard the progress of the work of any of the other prime contractors.

c. It is expressly understood by the Contractor that, on "multiple-prime" projects, the City relies primarily, but not exclusively, upon the organization, management, skill, cooperation and efficiency of the "Contractor for general construction" (unless a different Contractor is otherwise designated in the General Bidding and Contract Requirements or the Technical Specifications) to oversee, coordinate, and plan the work of all the other prime contractors, including, but not limited to, the prime contractors for electrical, mechanical, HVAC, and plumbing work, so as to complete the work under all of the prime contracts in a timely and efficient manner. The Contractor therefore expressly recognizes that the "Contractor for general construction" shall be the coordinating Contractor for all aspects of the multiple-prime contract work, including the scheduling of all such work. The Contractor shall have an explicit duty on "multiple-prime" projects to rely primarily upon the organization, management, skill, cooperation and efficiency of the "Contractor for general construction" to oversee, coordinate, and plan its work with the work of all of the other prime contractors, so as to ensure completion of the work under all of the contracts, including the Contract, in a timely and efficient manner and without disruption and interference. It is expressly understood by the Contractor, however, that the City is also relying upon the organization, management, skill, cooperation and efficiency of the Contractor so as to ensure completion of the work under the Contract in a timely and efficient manner and without disruption and interference.

d. It is expressly understood by the Contractor that time is of the essence of this Contract. The Contractor agrees to diligently prosecute its work in coordination and cooperation with the work of the other prime contractors and under the coordination of the "Contractor for general construction," without delay,

interference, or disruption, so as to ensure the completion of the Contract work in a timely and efficient manner and in conformity with the schedule approved by the City under the Contract. In the event that the Contractor shall unnecessarily delay, disrupt, or interfere with the work of any of the other prime contractors, the Contractor shall be liable for the payment of all costs and expenses incurred by such prime contractor or prime contractors on account of such delay, disruption, or interference. The Contractor accordingly authorizes the City to deduct the amount of such costs and expenses from any monies due and owing to the Contractor under the Contract. The Contractor shall further assume all liability, financial or otherwise, in connection with its Contract and shall protect, defend, and hold harmless the City from and against any and all damages or claims that may arise because of inconvenience, delay, interference, disruption, or loss experienced by the Contractor because of the presence and operations of other prime contractors working within the limits of the same multiple-prime project.

e. The provisions of this Paragraph 35 shall be read in conjunction with any provisions in the Technical Specifications, the Proposal, and the Plans, and, notwithstanding Paragraph 95 of these Standard Contract Requirements, the provisions of this Paragraph 35 shall take precedence over any other provisions in the Technical Specifications respecting the "coordination and cooperation" among prime contractors on a "multiple-prime" project, except where such other provisions shall impose greater duties upon the Contractor for coordination and cooperation.

36. Clean-up of Project Site. The Contractor and its Subcontractors shall remove all rubbish or refuse and all unused materials and tools from the Project site daily, if required by the Project Manager, and as the work progresses the Contractor shall carefully clean and keep the Project site clean from such rubbish and refuse. The Contractor shall furnish to the Project Manager upon request all documentation regarding the proper disposal of all rubbish, soil, refuse, and other debris. Before the City will approve the completion of the work under the Contract, the Project site and any other place or places affected by the work shall be thoroughly cleared of all construction and other debris and dust, and left clean, free from debris, construction plant, buildings, and materials; fit for travel or other proper use; and in as good condition as existed before the work was begun. The Contractor shall resod or plant anew any grass plot or plots disturbed, and replace any shrubbery destroyed. Structures shall be broom clean, free from stains, spots or other blemishes, and ready for use, and all glass shall be washed. The clean-up work shall be governed by the record of existing conditions made and filed with the Department prior to the commencement of work.

37. Maintenance after Completion and Contractor's Guarantee.

a. The Contractor shall guarantee the work of the Contract against defects in materials and workmanship for a period of one (1) year from the date of completion and acceptance of the work by the City, unless a longer period is specified, and shall guarantee and warrant that all equipment shall perform in accordance with the specifications of the manufacturer and in accordance with the Technical Specifications. When individual items of the Contract, including equipment, are formally accepted in writing by the Project Manager and used or operated by the City prior to the completion of the total work under the Contract, the period of guarantee for such items shall be calculated from the date of final written acceptance of such items, provided, however, that the item of work and equipment is used or operated by the City for a period of ninety (90) consecutive days following the date of acceptance without the occurrence of any defects, breakdowns, or faulty operation. Paving, including curbs and footway, shall be similarly guaranteed for a period of five (5) years from the date of completion and acceptance of the work by the City.

b. If, within such one (1) year or five (5) year period of guarantee, any of the work shall prove to be defective either in materials or workmanship, or if damage occurs by settlement of the backfill placed under this Contract, or if any part or parts of any equipment furnished shall prove to be inadequate, insufficient, or defective, either in design, materials, or workmanship, the Contractor shall immediately, upon demand of the Project Manager (whose decision as to such inadequacy, insufficiency, or defectiveness shall be binding and conclusive upon the Parties hereto), repair and replace the same in accordance with the Plans and Technical Specifications, and shall repair and replace any damage to other parts or structures at the Contractor's sole cost and expense, without cost or expense to the City, to the approval and satisfaction of the Project Manager.

c. Should the Contractor or its sureties fail to comply with the orders of the Project Manager to replace or repair defective materials, workmanship, or equipment as aforesaid within the time specified in

subparagraph (a) above, the Operating Commissioner shall notify the Procurement Commissioner, who shall have the right to declare the Contractor or its surety, or both, in default and to proceed with the correction of the defect in accordance with the methods provided herein.

38. Access to Accounting Records. The Contractor shall certify that all materials, equipment, and labor charged to the City are accounted for and shall keep such full and detailed accounts as may be necessary for proper financial management under this Contract. The Contractor shall retain, and shall provide the City and its representatives access to, all records, books of account, correspondence, instructions, Shop Drawings, receipts, vouchers, memoranda, and similar data and documentation pertaining to the Contract for a period of five (5) years following final payment, or earlier termination of the Contract, or for such longer period as may be required by law; however, if any litigation, claim or audit is commenced prior to expiration of said five (5) year period, then the records shall be retained until all litigation, claims or audit findings have been completely terminated or resolved, without right of further appeal, or if Applicable Law requires a longer period, then the records shall be retained for such longer period. From time to time during the performance of the work under the Contract, and for a period of five (5) years after the completion of the work under the Contract, the City may audit any and all aspects of the Contractor's performance under the Contract, including but not limited to its billings and invoices. Representatives, agents or contractors of the City, including the Department, or other authorized City representatives including, without limitation, the City Controller may conduct audits. If requested by the City, the Contractor shall submit to the City all vouchers or invoices presented for payment pursuant to the Contract, all cancelled checks, work papers, books, records and accounts upon which the vouchers or invoices are based, and any and all documentation and justification in support of expenditures or fees incurred pursuant to the Contract. All books, invoices, vouchers, records, reports, cancelled checks and other materials shall be subject to periodic review or audit by the City. All work, equipment, materials, systems, subassemblies, tools appliances and plant shall be subject to inspection and review by City, federal and state representatives, as may be applicable, or their designees, at the offices of the Contractor in the City, or in another location with the City's consent. The Contractor shall cooperate with all City, state and federal inspections and reviews conducted in accordance with the provisions of the Contract. Such inspection and review of the Contractor's work hereunder shall be in the sole discretion of the inspecting or reviewing entity. Such inspection or review may include, without limitation, review of staffing ratios and job descriptions, and meetings with any of the Contractor's staff who are either directly or indirectly involved in providing all or any portion of the work hereunder. The Contractor shall make available, within the City at reasonable times during the performance of the work hereunder and for the period set forth above in this Paragraph 38, all records pertaining to the Contract for the purpose of inspection, audit or reproduction by any authorized representative (including any agent or contractor and the City Controller) of the City, the Commonwealth Auditor General, and any other federal or state auditors, as may be applicable, at no additional cost to the City.

39. Sales and Use Tax; Federal Excise Tax.

a. The City is not subject to federal, state or local sales or use tax or federal excise tax. Contractor hereby assigns to City all of its right, title and interest in any sales or use tax which may be refunded as a result or the purchase of any materials in connection with the Contract, and the Contractor, unless directed by the City, shall not file a claim for any sales or use tax refund subject to this assignment. The Contractor authorizes the City, or its agent, in its own name or in the name of the Contractor, to file a claim for a refund of any sales or use tax subject to this assignment. To the extent it may be applicable to the work under this Contract, the Contractor covenants and agrees that it shall not bill the City for or otherwise pass-through to the City for payment any Federal Excise Tax paid in connection with the work under this Contract; in consideration of the Contractor's foregoing covenant, the City hereby consents to any filing by the Contractor for a refund of any Federal Excise Tax paid in connection with the work under this Contract.

b. The Contractor agrees to include the above referenced Paragraph in any Subcontracts with Subcontractors.

D. ADMINISTRATION, MEASUREMENT, AND PAYMENT

40. Status and Authority of the Project Manager. The Project Manager shall be responsible for the general direction of the work to be performed under the Contract, the interpretation of the Plans and General Bidding and Contract Requirements, and the Technical Specifications, the ordering of additions to or deductions from the work, and the determination of procedure. The Project Manager shall give all orders and directions contemplated under the Contract. The Project Manager shall in all cases determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under the Contract, and shall have authority and sole discretion to reject all work and materials which in his or her opinion do not conform to the requirements of the Contract. The Project Manager shall determine all other questions that may arise in relation to the execution of the work and shall have the authority to halt the work whenever such action may be necessary to secure the safe and proper execution of the Contract. The Project Manager shall adjust and decide any differences or conflicts that may arise between the Contractor and other prime contractors for the performance of concurrent work. The provisions of this Paragraph are not intended to supersede or limit the provisions of Paragraph 35.

41. Plans and Technical Specifications. The Plans, with all notes thereon, and the Technical Specifications are intended to be consistent with one another and of equal force and effect, and in the event the Contractor should believe that an apparent discrepancy may exist between the Plans and the Technical Specifications, the Contractor shall bring such apparent discrepancy to the attention of the Project Manager, who will interpret their meaning. The Plans give general dimensions and sizes, and such details as are required to cover special features. Figures shall have preference over scale in reading dimensions. The Contractor shall maintain at the site of the work for use of the Project Manager or Inspector one record copy of the Plans and Technical Specifications, and Change Orders and other Contract modifications, and one record copy of all approved Shop Drawings and other submittals, including the construction schedule.

42. Shop Drawings and Working Drawings. The Contractor shall prepare and submit to the Department or the Project Manager, as specified in the Technical Specifications or as required by the Project Manager, all Shop Drawings and Working Drawings, which shall include all details required to carry out the City's Plans and Technical Specifications. By approving and preparing Shop Drawings and other similar submittals, the Contractor represents that it has determined and verified materials, field measurements, and field construction criteria related thereto and has checked and coordinated the information contained within such Shop Drawings and submittals with the requirements of the Contract Documents. The Contractor shall not proceed with any portion of the work until the Shop Drawings or other submittal which governs the work has been approved. The Shop or Working Drawings shall conform to standards specified by the Department. Upon correction, if found necessary, and after approval, the Contractor shall furnish three (3) or more prints of the Shop Drawings or Working Drawings for construction purposes. After the completion of the work, the documents shall be delivered to and become the sole property of the City for its unrestricted use. The approval of Shop Drawings shall not relieve the Contractor of responsibility for the proper fit of the work, nor for its completion pursuant the Contract.

43. Lines and Grades – City Datum. Vertical dimensions are given in United States standard feet and fractions thereof. Unless otherwise stated, elevations preceded by a plus (+) or a minus (-) sign refer respectively to distances above or below the established City Datum, which is two and one quarter (2.25) feet above mean high water in the Delaware River at Chestnut Street, Philadelphia. Dimensions locating buildings and structures shall be verified and checked in the field by the Contractor before proceeding with construction details affected thereby. Curb line and paving stakes giving the requisite basic data will be set by the City. The price for the setting of these lines shall be at the predetermined rate as set by the Board of Surveyors and made part of the public record or as stated in the Contract Documents. The Contractor will be held responsible for the proper and correct extensions of measurements from such data, and the correctness of work based thereon. The Contractor will be held responsible for the preservation of stakes, benchmarks, and survey monuments, until authorized to remove them. Should any stakes be disturbed, the cost of replacing them will be charged against the Contractor at the then current fee as determined by the City's district surveyor and regulator, to be deducted from the Final Estimate. All survey monuments or benchmarks moved, covered or uprooted in the course of performance of the work of this Contract will be reset by the City at the expense of the Contractor, at the then current fee per monument or benchmark, as determined by the City's district surveyor and regulator. Said cost shall be deducted

from the Final Estimate. The Contractor shall provide reasonable and necessary opportunities and facilities for setting points and taking measurements. The Contractor shall not proceed until it has made timely demand upon the District surveyor and regulator for, and has received from him or her, such points and from the resident engineer such instructions as may be necessary for the progress of the work. Any work improperly done without lines or levels or instructions shall be removed and replaced by the Contractor at its own expense. Failure to do so may be considered a default under the Contract.

44. Contract Amount. The total amount which is to be paid by the City to the Contractor for the work performed and materials supplied under the Contract shall in no event exceed the sum of the Contractor's Quote price, plus a contingency fund of approximately ten percent (10%) of the Contractor's Quote price (to be specified by the Procurement Department upon the award of the Contract), which fund is intended to cover additional compensation which may be due to the Contractor as a result of Change Orders issued pursuant to Paragraphs 48 and 49 below, as such sum may be increased or reduced pursuant to a Change Order or Change Orders, or pursuant to an Amendment. The City shall specify the contract amount in the Notice of Contract Award. The Contractor acknowledges that the City's liability under the Contract shall be limited by the amounts which shall have been or may be from time to time appropriated by City Council. The City reserves the right to authorize the Contractor to commence work prior to appropriation of the total amount of the Contract, in which case the City shall give the Contractor notice thereof, and the City shall not be liable hereunder in any amount greater than that appropriated therefor by City Council. Payments will only be made payable to the Contractor as shown on the purchase order; the invoice must reflect this same Contractor name as the entity to "pay to". For any bids awarded for work to begin on or after July 1, 2019, the City has instituted a policy of making all of its payments through electronic deposits into the awarded Contractor's designated bank account. Before any City payments are made, the Contractor will be required to supply the City with the information necessary for the City to initiate electronic payments by completing one of the electronic payment processing enrollment forms available on the City's vendor portal at <https://secure.phila.gov/finance/vendorpayments>. Applicants awarded a contract before July 1, 2019 are encouraged to complete one of the electronic payment processing enrollment forms before the conversion to electronic payments becomes mandatory. The City intends to stop issuing paper checks. The foregoing notwithstanding, nothing herein shall be construed to limit the City's ability to make payments by assessment bills as provided in paragraph 57, below.

45. Scope of Payments. Payment for the cost of all work, labor, materials, and services required to complete the work of the Contract as shown in the Plans, Technical Specifications, Standard Details and Specifications, or as otherwise specified (except where payment is otherwise specifically provided), will be made at the unit prices or lump sum prices contained in the Quote. The prices contained in the Quote shall each cover the supply and installation, in a good, sound, substantial and workmanlike manner, of everything required for and incidental to the full completion of the work of that item as called for by the Plans, Technical Specifications, Standard Details and Specifications, or as otherwise specified, including its proportionate share of the expense of all plants, tools, and equipment required; the cost of all bonds, fees, and permits; of all administration, superintendence, and insurance; and of any loss or damages arising out of the nature of the work, from the action of the elements, from any unforeseen difficulties encountered in the prosecution of the work, and from risks of all kinds connected with the work, except as otherwise specifically provided in the Contract Documents.

46. Quantities are Approximate. When quantities of the various classes or components of work and materials required under the Contract are stated in the Bid Solicitation or elsewhere, such quantities are estimated and approximate, except where otherwise stated to the contrary. When stated in the Bid Solicitation or a Seller's Proposal, they are given only for the purpose of comparing the Quotes on a uniform basis. The City does not guarantee that such estimated quantities will correspond to the actual quantities ultimately required to complete the work, and the City will not allow any claim for damages, for anticipated profit, or for loss of profit of the Contractor in the event that actual quantities used to complete the work under the Contract vary from the estimates in the Bid Solicitation. The Department reserves the right to increase or decrease the quantities or to entirely omit any of the items as contained in the Bid Solicitation to the extent found necessary by the Project Manager, provided that the aggregate cost of the work performed is within the limit of funds fixed in the Contract.

47. Changes.

a. If changes to any portion of the work or the requirements of the Plans, Technical Specifications or Standard Details and Specifications are deemed necessary by the Project Manager, in order to carry out and complete the work covered by the Contract Documents, the Project Manager may by notice to the Contractor order alterations to or changes in the work covered by the Contract Documents, and the Contractor shall promptly comply with such orders. No changes or alterations to the work shall be made or performed by the Contractor except upon prior written orders from the Project Manager authorizing the change and a Change Order fixing the additional compensation or deduction therefor, except where the order authorizing the change states that the method of compensation or deduction shall be determined at a later date.

b. Where the Project Manager pursuant to Paragraph 47(a) orders additions to or deductions from the amount of work called for by the Plans or Technical Specifications, or where changes are ordered in writing in the design of the work or the requirements of the Plans or Technical Specifications which increase or reduce the cost of the work to the Contractor, adjustment in compensation therefor shall be made to cover the additional work required or the work reduced, in accordance with a written order of the Project Manager, as follows:

1. For work for which applicable unit prices are bid in the Bid Solicitation, payment or deduction shall be made in accordance with the prices bid. When the final quantity of work performed on a unit price bid item differs substantially (twenty-five percent (25%) or more) from the Bid Solicitation quantity, the Project Manager will review the price contained in the Quote and the actual work performed by the Contractor and may, in his or her sole discretion, determine if an adjustment is appropriate. Where the Project Manager deems an adjustment appropriate, the Contractor shall:

- i. substantiate that the Quote unit price remains fair and reasonable despite the substantial change in quantity; or
- ii. in the case of substantial underrun compared to the previously estimated quantity, negotiate a revised unit price for all the work actually completed; or
- iii. in the case of substantial overage compared to the previously estimated quantity, negotiate a revised unit price for that portion of the actual work completed in excess of one hundred twenty-five (125%) of the Quote quantity.

This provision shall not be deemed, however, to vest in the Contractor any rights to any adjustment.

2. For work not covered by the unit prices contained in the Quote, payment or deduction shall be made at the applicable contingent prices named for work.

3. For work for which neither the unit prices bid nor the prices for contingent work are applicable, payment or deduction shall be made in accordance with Paragraphs 48 and 49 below.

48. Change Orders by Agreement.

a. If alterations or changes increase the cost of the work to the Contractor, additional compensation will be allowed by the City, based upon unit prices, contingent prices, or by a detailed cost proposal submitted by the Contractor to the Project Manager, negotiated by the Department and agreed to by the Contractor, or by Force Account, in accordance with Paragraph 51 below. The cost proposal shall detail the costs of materials, labor, overhead and profit, as well as any proposed changes to the Contract time. If such alterations or changes reduce the cost of the work to the Contractor, the amount of such reduction may be deducted by the City, and any such reduction may be based upon unit prices contained in the Quote for the performance of the deleted items of work, upon any Subcontract already entered into by the Contractor for the performance of the deleted item of work, or upon a detailed cost proposal submitted by the Contractor to the Project Manager and negotiated by the Department. Credit Change Orders will include the same mark-ups as chargeable Change Orders. The Contractor shall submit its cost proposal for the change or alteration within twenty (20) days after the Project Manager gives notification to the Contractor of the intended change or

alteration. Thereafter, a formal Change Order will be executed and signed by the Department reflecting the change or alteration and the additional cost or reduction negotiated by both Parties.

b. A Change Order negotiated and agreed to by the Contractor and the City and then executed as a Change Order by the City and the Contractor shall be deemed to cover all of the Contractor's costs associated with the change or alteration to the work, as reflected in the Change Order, including all costs and expenses incurred by the Contractor for time, material, labor, and extended or field office or home office overhead. Any Contract time extension granted by the City for the Change Order shall be the sole time extension granted for the change or alteration and for which Contractor is entitled, and no other time extension shall be granted by the City in connection with the work reflected in such Change Order. No loss of profit on account of any changes or alterations to the work or on account of work not executed or performed by the Contractor will be allowed, except that the Contractor may be entitled to an extension of time on account of changes or alterations to the work, provided that the Contractor satisfies the requirements of Paragraph 25 above.

c. The Contractor agrees and acknowledges that after a Change Order is negotiated and agreed to by the Parties and then executed by the City, the Change Order shall operate as a full and complete waiver and release of any and all claims of the Contractor related to or arising out of such change or alteration, whether such change or alteration is considered individually or cumulatively, including, but not limited to, any claim by the Contractor for extended home office overhead, extended field office overhead, time-impact costs, schedule delay costs, acceleration costs, compression costs, loss of productivity costs, extra work, additional work, and interference costs, or any combination of such costs.

49. Disputed Change Orders. If, after submission of a cost proposal, the Department and the Contractor cannot agree upon a price within a reasonable amount of time, or if the Contractor disputes the applicability of unit prices or contingent prices, the Project Manager may direct the Contractor to perform or complete the extra or additional work notwithstanding that there is no agreement between the Parties as to price, and the Contractor shall proceed to perform the work so as to avoid any delay or interference to the progress of its work. In all such cases, the Contractor shall promptly comply and maintain proper force account time sheets and records, in accordance with Paragraph 51 below. The Project Manager shall also process a Change Order in an amount that he or she determines to be reasonable, necessary and appropriate. If the Contractor does not agree with the amount processed by this Disputed Change Order, the Contractor must notify the Project Manager within ten (10) days of issuance of the Disputed Change Order that it is proceeding under protest and that it reserves the right to a claim for the cost of the disputed work. In all cases of Disputed Change Orders which are protested by the Contractor, the Contractor shall submit to the Project Manager, within five (5) days after completion of the work, a detailed cost proposal which shall detail the costs of materials, labor, overhead and profit, actually expended by the Contractor for the work, as well as any changes to the Contract time.

50. Disputed Work. If the Contractor is of the opinion that any work required or ordered by the Project Manager violates the terms and provisions of the Contract or is not called for under the Contract Documents, the Contractor shall promptly notify the Project Manager, in writing, of its contentions with respect thereto and shall request a final determination thereof. If the Project Manager determines that the work in question is work required under the Contract Documents and is not "extra" work, or that the order complained of is proper, the Project Manager will direct the Contractor to proceed with the work in question. In all such cases, the Contractor shall promptly comply and maintain proper force account time sheets and records, in accordance with Paragraph 51 below. In order to preserve its right to claim compensation for such disputed work or damages resulting from compliance with such an order, the Contractor must notify the Project Manager in writing, within five (5) days of receiving notice from the Project Manager of this final determination, that the work is being performed or that the determination and direction is being complied with under protest. Furthermore, in order to claim an adjustment in the Contract price for work performed under protest, the Contractor must submit in writing to the Project Manager, within five (5) days after completion of the work in question, the nature and precise amount of compensation sought for the work, as well as copies of all force account time sheets and records compiled by the Contractor for the work. Failure of the Contractor to so notify the Project Manager of both its protest and its claim for compensation shall be deemed as a full and final release and waiver of any claim for extra compensation or damages therefor.

51. Force Account.

a. Payment under Force Account will be for the reasonable, actual and necessary direct cost of the work in accordance with the orders of the Project Manager, and in addition thereto the percentage of such cost hereafter stated. "Reasonable, actual and necessary direct cost" shall be deemed to include the following:

1. Wages of forepersons, equipment operators and skilled and semi-skilled and common laborers directly assigned to the specific operation at actual payroll rate of wages per hour and actual fringe benefits paid, labor taxes as established by law, and workers compensation and employers liability insurance, for each hour that such employees are actually engaged in the performance of the authorized work and, if directed, overtime, as provided by existing laws and regulations, as well as other insurance premium expenses, including but not limited to premiums for general liability insurance, where the such insurance premium expenses are a direct function of the foregoing wages, but only to the extent such insurance premium expenses derive solely from the foregoing wages.

2. The reasonable actual expenditure for materials (including sales tax paid, if applicable, and except as provided to the contrary in Paragraph 39 above), used up or incorporated in the work.

3. For any equipment, including machinery and trucks, mutually deemed as necessary for the performance of the work, the Project Manager shall allow the Contractor reasonable rental rates, computed as follows: (i) for all equipment rented, the Contractor will be reimbursed the reasonable actual costs based upon the receipts provided, plus an allowance for operating cost as provided in subparagraph (ii) of this subparagraph 51(a)(3).; (ii) for all equipment owned, including pumps and compressors, a reasonable hourly rate will be determined by using the reasonable monthly rental rates taken from the current edition (with updated supplements) of the Rental Rate Blue Book for Construction Equipment and dividing it by one hundred seventy-six (176); an allowance may be made for operating costs for each and every hour the machinery or equipment is actually operated in accordance with the rates listed in the aforesaid rental book; if the machinery or equipment is required to be at the work site, but is not operated, the Contractor may be compensated at the reasonable hourly rental rate, exclusive of operating costs. The Contractor will be allowed to add to the above rates the reasonable predominate areas adjustment percentage for the state as shown on the area adjustment map contained in the Rental Rate Blue Book for Construction equipment. In the case of any machinery or equipment not referred to in the Rental Rate Blue Book for Construction Equipment, a monthly rental rate shall be computed on the basis of an amount that is the equivalent of six percent (6%) of the manufacturer's list price for the sale (new) of such equipment; the hourly rate in such cases will be determined by dividing the monthly rate by one hundred sixty (160) when actually operating, and by one hundred seventy-six (176) when at the Project site, but not operating, to which no percentage shall be added. The above rates shall be for the time such equipment is required on the Project site for the performance of force account work exclusively.

b. To the reasonable, actual and necessary direct cost of the work done under Force Account as noted above, twenty percent (20%) will be added to the expenditure for labor and fifteen percent (15%) will be added to the expenditure for materials, excluding sales tax. No additions will be allowed for equipment costs, whether such equipment is rental or Contractor-owned. These percentages shall be deemed to cover the cost of heat, light, bond or bonds, use and up keep of small hand tools, administration, engineering, field and office superintendence, home office and site overhead, extended general conditions, non-payroll taxes, insurance (including general liability and non-payroll insurance), all loss, damage, risk and expenses incidental to the work and profit. The Contractor shall have no claim in excess of the above, such payments being in full compensation for the performance of such work and the furnishing of such materials and for all expense in connection therewith and incidental thereto.

c. Should the Contractor subcontract any portion of the work, with the prior written approval of the Project Manager, payment for that portion will be computed as the reasonable, actual and necessary costs defined above (exclusive of any profit to the Subcontractors), plus the percentages allowed, plus eight percent (8%) mark-up of the total paid to the Subcontractor. No additional percentage mark-up by or for any additional tiers of Subcontractors will be allowed.

d. The Contractor shall submit daily a statement in duplicate of work done on a Force Account

basis within twenty-four (24) hours of the time the work is done, and representatives of the Project Manager and the Contractor shall make daily comparison of the time and rates of labor, material used, etc., as shown therein. After correction, if necessary, this comparison shall be signed by each and filed with the Project Manager and the Contractor. The Contractor shall submit to the Project Manager monthly, prior to each Current Estimate, four (4) copies of an itemized statement of the amount and value of labor and materials furnished, accompanied by the original invoices for work performed under a Subcontract, and by an affidavit certifying the correctness of such statement. The Project Manager shall have access to any books, vouchers, time sheets, records, and memoranda showing the labor employed and the materials actually used on the specific operation and the actual net cost thereof, for the Contractor and any Subcontractor(s). Daily force account time sheets must include the name and job titles of employees, actual starting and quitting times, and the total number of hours worked each day by each employee.

e. Work done under Force Account shall be subject to all of the requirements of the Contract. It shall be prosecuted in an orderly, reasonable and economical way, and the prices paid for labor and material and the method of prosecuting the work shall be subject to the approval of the Project Manager. Neither work nor material will be paid for under Force Account unless it is ordered as such in writing.

52. Lump Sum Bid Breakdown; Applications for Payment. In order to assist the Project Manager in estimating approximate quantities and the value of the work performed, the Contractor shall furnish in writing to the Project Manager within thirty (30) days after the issuance of the Notice to Proceed, an apportionment of any lump sum Quote (the "Lump Sum Bid Breakdown") showing in detail its component parts. The Lump Sum Bid Breakdown shall be subject to the approval of the Project Manager. In addition, the Contractor shall furnish within sixty (60) days of the commencement of the work, and thereafter every thirty (30) days until Substantial Completion of the work, an application for payment (the "Application for Payment") which shall set forth in detail the approximate quantities and value of the work performed as of the date of the Application for Payment in conformity with the approved Lump Sum Bid Breakdown. The Contractor shall certify that the information set forth in the Application for Payment is true, correct and complete, and accurately and fairly represents the work performed to date by the Contractor in accordance with the Contract Documents.

53. Current Estimates.

a. The Project Manager, after receipt of an Application for Payment, shall prepare a current estimate (the "Current Estimate") of the approximate quantities and value of the work performed at intervals of about one (1) month during the progress of the work, except that the first Current Estimate may be prepared within sixty (60) days of the commencement of work under the Contract, provided at all times, however, that the Contractor is in compliance with all of the requirements of the Contract and the value of the work done during the time covered by the Current Estimate exceeds the amount of fifteen hundred dollars (\$1,500). The City shall make payments to the Contractor on the basis of the Current Estimates, when approved by the Project Manager. The City shall have no obligation to pay interest on the amount due under any Current Estimate, any provision of Applicable Law to the contrary notwithstanding. Payments on uncompleted items will be for the value of work done and materials furnished, as apportioned by the Project Manager. The Current Estimates are approximate only, and subject to correction in the Final Estimate. The payment of a Current Estimate shall not bind the City to the acceptance of any materials furnished or work performed by the Contractor. The City shall not be precluded from later contesting a Current Estimate and shall enjoy every legal defense, or other claim or counterclaim, in recoupment or otherwise, by reason of the character, quality, and quantity of the work and materials covered by a Current Estimate, notwithstanding payment of a Current Estimate.

b. The City may withhold payment for deficient items according to the terms of the Contract. The City shall pay the Contractor according to the provisions of 62 Pa. C.S.A. §§ 3931 et seq., as amended, Subchapter D, Prompt Payment Schedules, for all other items which appear on the Application for Payment and have been satisfactorily completed. If the City withholds payment from the Contractor for a deficient item, it shall notify the Contractor of the deficient item within sixty (60) calendar days of the date that the City received the Application for Payment.

c. Subject to the provisions of subparagraph (e) below, Current Estimates on Contracts which include the furnishing or installing of electrical, mechanical, plumbing, heating, and other equipment, systems or

components especially fabricated as part of the work under the Contract, which are subject to mechanical or electrical test, will include payment of invoice or invoices previously paid by the Contractor, not to exceed ninety percent (90%) of the amount shown on the Lump Sum Bid Breakdown approved by the Project Manager for such equipment, systems or components, when such equipment is delivered to the site, City property, or a bonded warehouse approved by the Project Manager. The City shall pay the balance of ten percent (10%) upon completion of successful testing of such equipment, systems or components, and acceptance thereof by the City. If no invoice is available, the City will pay the Contractor fifty percent (50%) of the cost of such specially fabricated equipment, systems or components, in conformity with the Lump Sum Bid Breakdown when delivered to the site, City property, or a bonded warehouse approved by the Project Manager, and an additional forty percent (40%) when such equipment, systems or components are installed and ready for test. The City shall pay the balance of ten percent (10%) upon completion of successful testing of such equipment, systems or components, and acceptance thereof by the City. The Current Estimates described in this subparagraph shall be reduced by the retainage required under Paragraph 54 below.

d. Subject to the provisions of subparagraph (e) below, Current Estimates may also include, when authorized by the Project Manager, an amount equal to the actual cost of specially fabricated materials and equipment not subject to electrical or mechanical test, furnished but not incorporated into the work, provided that the quantity allowed does not exceed the corresponding quantity estimated in the Contract Documents. The Current Estimates described in this subparagraph shall be reduced by the retainage called for in Paragraph 54 below.

e. Before including payments for equipment and materials described in subparagraphs (c) and (d) above in a Current Estimate, the Project Manager must be satisfied that:

1. the equipment and materials are properly stored, insured and protected through appropriate security measures;

2. paid invoices of suppliers support the Contractor's actual net cost for the equipment and materials;

3. the equipment and materials will be incorporated in the work under this Contract within a reasonable period; and

4. the Contractor assumes full responsibility for the safe storage and protection of the equipment and materials. If the equipment and materials paid for hereunder are damaged, stolen or prove to be unacceptable, the payment made therefor shall be deducted from subsequent estimates and payments unless the equipment and materials are promptly replaced to the satisfaction of the Project Manager and in conformity with the requirements of the Contract Documents. Equipment and materials shall be available for inspection and inventory at the storage site by the Project Manager or his or her authorized representative at all times. Upon payment, title to all such equipment and materials shall be vested in the City, free and clear of any and all debts, claims, liens, mortgages, taxes and encumbrances. The Contractor, at its own expense, shall execute such documents and take such other steps as reasonably required by the City to vest the aforesaid title in the City.

f. The Contractor for itself and any and all Subcontractors acknowledges and agrees that neither the Contractor nor any Subcontractor has any right to file a mechanics', materialman's or other lien against the Project site under the Pennsylvania Mechanics' Lien Law of 1963, Act of August 24, 1963, P.L. 1175, 49 P.S. § 1101 *et seq.*, as amended, or under any other law.

54. Retainage. Act 57 of 1998, 62 Pa.C.S. §3921, as amended, shall govern the withholding of retainage on the Contract. Provided that the Contractor is making satisfactory progress and is in compliance with all of the requirements of the Contract and there is no specific legal or other basis for the withholding of greater amounts, retainage under the Contract shall be ten percent (10%) of the amounts due the Contractor until fifty percent (50%) of the work under the Contract is completed, at which time one-half (½) of the amount then retained shall be returned to the Contractor, and thereafter five percent (5%) of the amounts due the Contractor until substantial completion of the Contract.

55. Semi-Final Estimate and Punchlist.

a. Upon substantial completion of the Contract, the Contractor shall submit an Application for Semi-Final Estimate (the "Application for Semi-Final Estimate"), which shall include a request for a semi-final inspection of the work under the Contract. The Project Manager shall make a semi-final inspection within thirty (30) days of the City's receipt of the Application for Semi-Final Estimate and request for inspection. If, based on said inspection, the City determines that the Contractor has Substantially Completed the work under the Contract, the Project Manager shall issue a certificate of Substantial Completion, which shall include the punchlist items required under subparagraph 55(b) below, and the Project Manager shall process the Semi-Final Estimate. The City shall, upon receipt of said Application for Semi-Final Estimate and upon receipt by the City of any guarantee bonds and other written warranties which may be required in accordance with the contract to ensure proper workmanship for a designated period of time, make payment on the Semi-Final Estimate within forty-five (45) days after issuance of the Certificate of Substantial Completion, except as provided in Paragraph 54 above, and less such additional sums as the City may withhold pursuant to this Paragraph 55. The City shall have the same right to withhold payment from the Semi-Final Estimate as is set forth in subparagraph 53(b) above with respect to Current Estimates. The City shall pay interest on the amount due under the Semi-Final Estimate to the extent provided by Applicable Law. Except as provided in Paragraph 54 above, the Semi-Final Estimate shall reduce the retainage withheld by the City to one and one-half (1½) times the amount required to complete any remaining uncompleted items of work, provided that the Contractor has made satisfactory progress towards completion of the Contract and is in compliance with all of the requirements of the Contract and provided there is no legal or other basis for the withholding of a greater amount. The City reserves the right to withhold additional retainage to the extent the same as is permitted under 62 Pa.C.S. § 3921, as amended.

b. Upon preparation of the Semi-Final Estimate, the Project Manager, with the assistance of the Contractor, shall list in detail and in comprehensive fashion the remaining uncompleted items of work, and a reasonable cost of completion for each item on said list, or such other basis for payment thereof as may be provided in the Contract (which ever method may apply pursuant to the Contract), in an official punchlist which shall thereafter be issued in writing to the Contractor. If the Contractor disputes any of the items on the official punchlist, the Contractor must notify the Project Manager in writing, detailing the items in dispute and the nature of its dispute, with all supporting documentation, within five (5) days after receipt of the official punchlist. The Contractor must commence work on the official punchlist within ten (10) Working Days after receipt of the official written punchlist. The Contractor shall thereafter proceed promptly and expeditiously to complete the official punchlist items, and shall give notice to the Project Manager in writing of the date on which the Contractor completes the official punchlist items. The Contractor shall perform and complete all work on the official punchlist at its sole cost and expense and at no additional cost or expense to the City, subject to payment of the Final Estimate under Paragraph 56 below. The Contractor's work in completion of the official punchlist items shall in all respects be governed by the requirements of the Contract Documents.

56. Final Estimate and Inspection. The Project Manager shall conduct final inspection of the work, including the completion of all punchlist items, after completion of all punchlist items to the Project Manager's satisfaction and within thirty days (30) of receipt of the Contractor's formal written request for such final inspection and application for Final Estimate (the "Application for Final Estimate") (which request the Contractor shall not make until completion of the punchlist items). After the punchlist inspection, and provided that all the requirements of the Contract Documents have been complied with to the satisfaction of the Project Manager, including completion of all official punchlist items, the Project Manager will prepare a final payment (the "Final Estimate") and, based upon the Final Estimate, the City will pay the balance due to the Contractor, after all allowable additions and deductions have been made, by checks drawn by the City Treasurer or assessment bills as provided in Paragraph 57 below, or a combination of these two methods of payment. The foregoing to the contrary notwithstanding, the City shall have the same right to withhold payment from the Final Estimate as is set forth in subparagraph 53(b) above with respect to Current Estimates.

57. Assessment Bills. Where required by ordinance of the City Council of the City, the Contractor shall receive, and accept as payment, assessment bills against abutting property, as compensation for furnishing materials, labor, tools, and equipment, and for doing the work set forth in the Contract Documents. The Contractor shall collect such assessment bills at its own cost, and employ all legal remedies or proceedings, whether by lien, civil action, or otherwise, including recourse to the appellate courts, to which the City may be entitled. The

Contractor acknowledges and understands that the City does not in any way guarantee either the value, or the collection, of any assessment bill or bills, and that in the event of neglect to properly file and collect the assessment bill or bills, no recourse shall be had to the City by reason thereof. The Contractor hereby accepts and assumes all risk of failure to collect any such assessment bill or bills.

58. Contractor Claims.

a. Except as otherwise provided in these Standard Contract Requirements, the Contractor must notify the Project Manager in writing of any and all claims whatsoever relating to or arising out of Contractor's performance of the work under the Contract within ten (10) days of the event or occurrence giving rise to the claim, except where a shorter time is specified by the Contract Documents. The written notice of claim to the Project Manager shall provide a detailed statement of and basis for the claim, with supporting documentation attached. For purposes of this Paragraph 58, a "claim" shall mean a demand or assertion by the Contractor seeking, as a matter of right, an adjustment or interpretation of the Contract, payment of money, extension of time or other specific relief with respect to the terms and conditions of the Contract. The Project Manager will review all claims submitted by the Contractor and shall approve or reject each claim in whole or part, or shall request additional documentation in support of the claim from the Contractor.

b. The City and the Contractor hereby release and waive any and all claims against each other for consequential damages arising out of or related to the Contract and the work performed thereunder. This mutual release and waiver includes damages incurred by the Contractor for principal home office expenses, including home office overhead and the compensation of personnel stationed there, for losses of financing, business, and reputation, and for loss of profit associated with any other work, except anticipated profit arising directly from the Contract and the work thereunder. Nothing hereunder shall preclude, however, the assessment by the City of liquidated direct damages, when applicable in accordance with the Technical Specifications, General Bidding and Contract Requirements, and other applicable locations in the Contract Documents, or damages pursuant to Paragraph 25(h) above.

c. After Substantial Completion of the work under the Contract, but prior to the Contractor's acceptance of the Final Estimate, the Contractor shall notify the Project Manager in writing of any and all unresolved and previously asserted claims relating to or arising out of the work. The Contractor's written notice of claims to the Project Manager shall list the claims by number, assign a dollar value to each claim, and provide a detailed statement of each claim, with supporting documentation attached, including a copy of the notice by which the Contractor first brought the claim to the attention of the Project Manager.

d. Failure of the Contractor to notify the Project Manager of any claims in accordance with subparagraphs (a) and (c) above, and the Contractor's acceptance of and negotiation of payment under the Final Estimate under Paragraph 55 above, shall constitute and operate as a full and final release and a waiver of all such claims by the Contractor.

59. Review by Project Manager of Contractor Claims and Compulsory Non-Binding Mediation of Contractor Claims.

a. Within thirty (30) days after receipt of the Contractor's notice to the Project Manager under Paragraph 58(c) above, the Project Manager shall review all identified claims of the Contractor and shall notify the Contractor whether the claims are approved or rejected, in whole or in part.

b. Any claim of the Contractor which shall have been rejected by the Project Manager, in whole or in part, shall be subject to non-binding mediation. Mediation of the claim shall be an irrevocable condition precedent to institution of legal proceedings by the Contractor against the City with respect to such claim.

c. The Contractor must submit its demand for mediation to the Project Manager and the City of Philadelphia Law Department, c/o Chief Deputy City Solicitor, Affirmative and General Litigation Unit not later than 30 days after the Project Manager's notice of rejection. Failure of the Contractor to submit such claim to mediation within this time period shall be an absolute bar to institution of legal proceedings by the Contractor.

d. The Contractor shall submit a written timely request for mediation to the Project Manager and the City of Philadelphia Law Department, c/o Chief Deputy City Solicitor, Affirmative and General Litigation Unit. Upon submission of the claim to mediation, the City and the Contractor shall endeavor to resolve the claim by mediation in accordance with such rules as may be mutually agreed upon by the City and the Contractor.

e. The fee of the mediator, who shall be selected jointly by the parties, and the common expenses and costs incurred in connection with conduct of the mediation, shall be borne equally by the City and the Contractor. The mediation shall be conducted in the City of Philadelphia. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

60. Contractor's Liability for Services and Materials.

a. Notwithstanding the acceptance and approval by the City of any work the Contractor shall continue to be responsible for the professional quality, technical accuracy and the coordination of all work under the Contract. The Contractor shall, without additional compensation, correct any defects, deficiencies or omissions in the work.

b. The City's review, approval, or acceptance of, or payment for, any of the work performed under the Contract shall not constitute any representation, warranty, or guaranty by the City as to the substance or quality of the work reviewed, approved, or accepted, and shall not be construed to operate as a waiver or estoppel of any of the City's rights or privileges under the Contract, nor of any cause of action arising out of the performance of the Contract. No Person shall rely in any way on such review, approval or acceptance by the City. The Contractor shall be and remain liable in accordance with the Contract and Applicable Law for all damages to the City caused by the Contractor or the work under the Contract. Review, approval or acceptance by the City or the Project Manager under the Contract shall not constitute approval otherwise required by any City department, board, commission, or other regulatory agency in the exercise of such department's, board's, commission's or agency's independent regulatory authority of police powers under applicable law.

61. False Claims. The Contractor covenants and agrees that it shall promptly reimburse the City for (a) all sums paid to the Contractor by the City as a result of any false, fictitious or fraudulent billings, invoices, contract overcharges, and the like, and (b) all other costs which are incurred by the City as a result of the false fictitious or fraudulent billings, invoices, contract overcharges and the like. The Contractor further covenants and agrees that it shall promptly reimburse the City for all expenses and costs, including but not limited to attorneys' fees and expenses, incurred by the City in recovering any such sums from the Contractor. This Paragraph shall survive termination of the Contract and completion of the work under the Contract.

E. MATERIALS, WORKMANSHIP, AND INSPECTION

62. Materials and Workmanship. The materials used in the work under the Contract shall conform to the requirements of the Plans, Technical Specifications and Standard Details and Specifications, as the same may be applicable. The workmanship shall be equal to the best standard practices. Work of reconstruction and restoration of privately-owned structures adjacent to the Project site shall be as set forth in the Plans and Technical Specifications or otherwise by written agreement with the owner or owners of such structures. Where no requirements are specified for materials or for the methods of testing materials or equipment, such materials or methods shall at least equal the latest standard or tentative specifications of nationally recognized standardizing agencies, such as the American Society of Mechanical Engineers, the latest codes of the National Board of Fire Underwriters or, as they apply, any regulations of the City.

63. Inspection. All of the work of the Contract shall be subject to general direction and inspection of the Project Manager or the Project Manager's designated representatives, and the Contractor shall afford every opportunity for the inspection of materials and workmanship. Authorized representatives of the City shall be permitted access at all reasonable times to all portions of the work, and to such portions of the place of manufacture of fabricated materials as may be necessary for complete inspection. Before beginning work the Contractor shall notify the Project Manager of the type and source of supply of the principal materials which the Contractor proposes to furnish, and, as soon as possible thereafter, shall furnish samples of materials, fixtures, and appliances for approval by the Project Manager. Before removal of any excess excavated material, waste, refuse,

or rubble, etc., from the site, the Contractor shall furnish to the Project Manager a list of certified dump site or landfill locations that are to be utilized for disposal of such waste materials and written verification that permission for the disposal of the waste materials has been obtained. Before beginning the fabrication of materials, equipment or systems, and before shipping materials, equipment or systems of a specified type, the Contractor shall notify the Project Manager in ample time to permit inspection at the place of manufacture or shipping, should the Project Manager so desire. Such materials, equipment or systems shall be delivered to the Project site properly marked for identification, and shall be subject to re-inspection and final acceptance or rejection at the Project site by the City. The Contractor shall deliver materials, equipment and systems to be inspected at the Project site in ample time for such inspection and testing. No materials, equipment or systems shall be incorporated into or used in connection with the work until accepted by the Project Manager, and all materials, equipment or systems rejected by the Project Manager as unsuitable or not in conformity with the Plans or Technical Specifications shall be immediately removed from the work. Unless otherwise specifically provided for, the City shall bear the cost of inspection and testing. All work shall be prosecuted in the presence of the City's Inspector ("Inspector"), and conformity with the requirements of the Contract Documents. The Contractor shall provide for inspection and testing to be carried out during regular working hours unless specifically authorized or directed otherwise by the Project Manager. The presence of the Inspector shall not affect in any way the duty of the Contractor to complete the work in accordance with the Contract Documents, nor be deemed a defense on the part of the Contractor for default or violation of the Contract. The Inspector is not authorized to waive, amend, revoke, alter, enlarge, relax, or release any of the requirements of the Contract Documents.

64. Investigation of Work. If the Project Manager at any time has reason to suspect that the Contractor may have delivered any unsuitable, unfit or otherwise defective work, the Project Manager may order an investigation thereof, and the Contractor shall furnish the necessary labor and equipment for such investigation. If the City finds that any part of the work is defective, the Contractor shall repair, replace or reconstruct such work to the satisfaction of the Project Manager, and the cost thereof and of such investigation shall be the sole responsibility of the Contractor. If the work is found to be in accordance with the Contract Documents, the City will reimburse the Contractor, in accordance with Paragraph 51 above, for the expense of the examination.

65. Defective Work or Material. The Contractor shall remove, at its own expense, any work or material rejected by the Project Manager as unsuitable, unfit, or otherwise defective and not in accordance with the Contract Documents, and shall repair, replace or reconstruct the same without additional compensation. Failure to do so shall be deemed a violation of Contract and shall be subject to the provisions of the Contract concerning violations and defaults. Any omission or failure on the part of the Project Manager to disapprove or reject any work or material shall not be construed to be an approval or acceptance of any such defective work or material. For any work or material that is determined to be defective and not in accordance with the Contract Documents, but which in the sole determination of the Project Manager cannot be remedied or does not require total replacement, the Project Manager shall determine an appropriate credit due the City from the Contractor.

F. CONSTRUCTION REQUIREMENTS

66. Prosecution and Performance of Work. The Contractor's methods for the performance of the work must be those best adapted for the safe, efficient, and expeditious prosecution of the work, with a minimum of interference to adjoining work sites, to adjoining properties, and to public traffic and convenience. The Contractor shall prosecute the work vigorously, without delay, and with such workforces and equipment as shall be satisfactory to the Project Manager. The Contractor shall furnish and supply all labor and materials, in the quantity and of the quality required for the proper and timely performance of the work under the Contract; all such materials shall be of the best kind and quality and subject to the inspection and approval of the Project Manager. The Contractor shall strictly conform to the orders, instructions and directions given by the Project Manager, it being expressly understood and agreed that the decision of the Project Manager on any questions arising in connection with the performance of the work under Contract shall be binding and conclusive upon the Contractor. The Contractor shall supervise and direct the work, and Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of its work under the Contract. Before commencing the work, the Contractor, when required by the Project Manager, shall submit for approval its proposed methods of prosecution of the work, including the maintenance

of both vehicular and pedestrian traffic; underpinning, bulk heading, shoring; sinking foundations; handling spoil; lighting; fencing; street surfaces; drainage; and all other branches of its work operation. Such approval is intended to safeguard the City's interest, but such approval will not be deemed to relieve the Contractor of its obligation or responsibility for the safe and proper conduct of the work. The Contractor shall at all times ensure that its work site, and its Subcontractors' personnel, while performing any part of the work under this Contract, are and remain free of the influence of alcohol or illegal drugs. The Contractor shall at all times enforce good discipline and order among its employees, and shall not employ any unfit Person or anyone not skilled in the task assigned. Any contact by the Contractor or its employees with adjacent property owners, passing motorists or pedestrians, and the general public shall at all times be professional, courteous, and respectful.

67. Right of Way. Where work is constructed on private property in the lines of an unopened street, the City guarantees the Contractor, for access and construction purposes, the area only within the lines of said street. Where work is constructed over private property, not within the lines of any street upon the City plan, the City guarantees the Contractor right-of-way between lines not more than twenty-five (25) feet, each side, beyond the outside lines of the structure to be built, unless otherwise provided for, with right of access only within the lines of this strip and subject to the limitations of existing structures. Where work is constructed within the lines of an open street, the City guarantees the Contractor use of the area only within the lines of the street, and subject to the requirements of the Standard Contract Requirements and Technical Specifications for maintenance of travel, existing structures, and access to abutting properties.

68. Maintenance of Traffic and Access to Property. Traffic of all kinds shall be maintained continuously and access to buildings shall be provided for at all times, except where otherwise specifically permitted by the Contract Documents, or where temporary interference is authorized by the Project Manager, in which case it shall be interrupted only for such time as is necessary to provide temporary substitutes for surfaces disturbed by the construction and to restore street and sidewalk surfaces after the completion of the work. Suitable bridges or other means of access shall be built and maintained to permit owners and occupants to reach their premises. Where necessary, the Contractor shall maintain proper and easy means for passengers to enter or exit public transportation. Where partial occupation of the street is allowed, materials and equipment shall be so placed as to ensure a minimum of interference with traffic; no materials shall be placed on the sidewalk within one foot of the curb line, and a clear sidewalk passage not less than four (4) feet in width shall be maintained at all times. The work shall be so conducted that annoyance to residents and interference with the normal use of the properties will be reduced to a minimum. The flow in gutters and inlets shall be maintained. When access to any adjacent property is temporarily cut off, owing to occupancy of the street by the Contractor, the Contractor shall render every assistance to the owner or occupant in handling materials of every description that must be delivered to or removed from such property, including recyclables, rubbish, and garbage, and such materials shall be taken to or from the nearest accessible point that, in the opinion of the Project Manager, is convenient for handling. No additional compensation will be allowed for the various items of expense noted above in this Paragraph 68.

69. Maintenance of Waterways. In navigable streams all work shall be carried on in full compliance with the requirements of the United States Department of the Army, the Commonwealth, the City and any other governmental or quasi-governmental agency, authority or commission having jurisdiction under Applicable Law. Movement of boats and vessels of all kinds shall be maintained unless the United States Department of the Army or any other governmental or quasi-governmental agency, authority or commission having jurisdiction under Applicable Law shall permit interference, and then only within the limits and times specified. Should the Contractor, during the progress of the work, sink, lose, or throw overboard any material, plant, equipment, machinery, etc., which may be dangerous to or obstruct navigation, the Contractor shall forthwith recover and remove the same. The Contractor shall give immediate notice to the proper authorities of such obstruction, and, if required, the Contractor shall, under the direction of such authorities mark or buoy such obstructions until the same are removed. Upon the completion of any work affecting waterways of any character, all equipment and materials deposited in such waterways shall be removed unless otherwise ordered or permitted, so as to leave an unobstructed channel of the same width and depth and with the banks, retaining structures, or wharves in a condition equal to that existing before the beginning of work.

70. Access to Fire Hydrants and Fire Alarm Boxes. Fire hydrants shall be left at all times clear of obstructions and readily accessible to fire apparatus. No material or other obstructions shall be placed within ten

(10) feet of a fire hydrant. Fire alarm boxes shall be supported and protected and maintained so as to be readily accessible and open to view. Excavation shall be decked or bridged, where necessary, to permit the safe passage of fire apparatus and to give access to fire hydrants and to adjacent buildings for the extinguishing of fires. Where necessary, branch pipes shall be extended from the nozzles of the fire hydrants to the mains. Fire hydrants and any branch pipes shall be protected from freezing, and the fire hydrants (particularly the high pressure type) shall, where necessary, be braced or tied to the connecting pipes to prevent movement under water pressure.

71. Temporary Buildings. Buildings, fences, trailers, and equipment erected or provided by the Contractor shall be neat in appearance. Except as provided in Paragraph 74 below, no advertising matter, other than Project information and the name and address of the Contractor, shall be displayed on the work or any such buildings, fences, trailer or equipment.

72. Danger Signals. The Contractor, at Contractor's own expense, shall erect and maintain all necessary barricades, and danger signs and signals. The Contractor shall keep adequate lights burning from sunset until sunrise, and shall provide security personnel as necessary for the safety of the public. The Contractor shall observe such rules relative to signals and safeguards as the police regulations, harbor regulations, and other Applicable Laws require.

73. Street Closings and Detour Signs. In the event that the work requires the closing of a street or roadway, the Contractor shall first obtain a permit from the City's Department of Streets. When the Department of Streets gives permission to close a street or roadway during Contract operations and to divert the traffic therefrom, the Contractor, at the Contractor's sole expense, shall erect and maintain appropriate traffic and highway barricades, detour signs, and any other necessary traffic signs in order to safely protect vehicular and pedestrian traffic. The Contractor shall notify the Department seven (7) days prior to the date of starting work and one (1) day prior to the date of completion. Copies of these notices shall be sent to the Traffic Engineer of the Department of Streets.

74. Contract Identification Signs. The Contractor shall, unless specified otherwise in the Technical Specifications, at Contractor's own expense, erect and maintain in a prominent position upon the Project site at a location approved by the Project Manager, a suitable sign, plainly lettered with the name and address of the Contractor, the character of the work and the name of the Department under which the Contract is being carried out. No advertising matter other than the signs above noted shall be displayed on the work.

75. Safety and Sanitary Provisions. The Contractor shall provide means and appliances and shall enforce suitable rules for the safe prosecution of the work and for the safety and health of the work force employed on it. The completed portions of the work shall be kept clean and in a sanitary condition. The Contractor shall provide and maintain properly secluded sanitary conveniences, in accordance with existing regulations of the Department of Public Health, for the use of Contractor's work force, and the Contractor shall strictly enforce the exclusive use of them by its work force.

76. Storage Space. Buildings, yards, or sidings that may be required for the delivery or storage of materials shall be provided by and at the cost of the Contractor. The Contractor may not use streets for storing materials unless otherwise specifically authorized in writing by a permit issued by the City's Department of Streets. Upon request of the Project Manager, the Contractor shall furnish a copy of any agreement for the use of a property or building for construction purposes, except where owned by the Contractor.

77. Night Work. Work during the night shall be carried on with due regard to the comfort of, and so as to minimize any disturbance to, nearby residents, and the methods to carry out such work shall be subject to the approval of the Project Manager, who may, if conditions so require, order that no night work be done in specific localities. The Contractor's work force shall refrain from loud noises, calls, whistles, and the operation of air compressors, rock drills, riveting machinery, and blasting between the hours of 7:00 p.m. and 7:00 a.m. unless specifically permitted by the Project Manager.

78. Power and Light. In developed portions of the City, and elsewhere when ordered by the Project Manager, the Contractor shall use either electric, compressed air or internal combustion engine power. When compressed internal combustion engines are used the exhaust shall be muffled. None but electric lights

shall be used in or under buildings or anywhere on the work below the surface of the street.

79. Use of Water. Permission for the use of City water shall be obtained directly from the Philadelphia Water Department. Water may be obtained through a hydrant attachment or as otherwise specified in the Technical Specifications. In all cases, the Contractor shall obtain and use such water in accordance with regulations of the Water Department. If the Contractor shall, at any time, waste water (as determined by the Project Manager) obtained from the Water Department, the Project Manager shall revoke permission for such use. No charge will be made for the use of water actually used for the construction work, unless specifically set forth elsewhere in the Technical Specifications.

80. Prevention of Dust and Smoke.

a. The Contractor shall keep the surface of the sidewalks and streets affected by its work, including decking and temporary paving, in a clean, neat condition. The Contractor shall sprinkle with water or otherwise treat the surface sufficiently to keep down any dust generated during the progress of work. Piles of dirt or other material shall not be left on the surface. The aforementioned requirements are not intended to take the place of the usual duties of the Department of Streets but to supplement them. No fires of any kind or burning of debris on the site or adjacent to it will be permitted; the debris shall be disposed of off the Project site.

b. The Contractor shall comply strictly with the provisions of the Air Pollution Code (Title 3 of The Philadelphia Code, as amended).

81. Explosives. If any blasting is involved in the performance of the Contract, the Contractor must obtain a blasting permit from the Department of Licenses and Inspections. Such permits will be issued only upon approval of the Fire Marshal and posting of bond or Certificate of Insurance covering personal injuries and property damage. Blasting may be done only by blasters duly licensed by the City. Storage of explosives and transportation of explosives to the site also require permits, which are issued by the Department of Licenses and Inspections, subject to prior approval of the Fire Marshal.

82. Work in Freezing Weather. Masonry of all kinds, pointing, grouting, plastering, and other work subject to the action of frost shall not be done when exposed to freezing weather, except under conditions where the Project Manager may specifically direct or permit such work, subject to the heating of materials, the protection of finished work and such other measures as may be deemed necessary. If operations are suspended on account of freezing weather, the entire work shall be properly protected until the resumption of work is permitted. If a suspension of the work on account of freezing weather or from any other cause is necessary, the site shall be cleaned up, left in good order, and continuously maintained by the Contractor during the period of such suspension.

G. SURFACE, SUBSURFACE, AND OVERHEAD STRUCTURES

83. Completeness of Data. The term "structures" used in these Standard Contract Requirements shall apply to all surface, underground, and above-ground structures of whatever character within the Project site or immediately adjacent thereto, including buildings situated in or adjacent to the excavation. Where these structures are shown or indicated on the Plans, the information provided is in accordance with the information in the possession of the Department, but is approximate only. Such data are not warranted or guaranteed by the Department to be either complete or correct, and the Contractor shall and must assume, and adjust its Quote to account for, all risks resulting from conditions in the field that differ from the approximation shown.

84. Support and Protection. All structures, unless specifically designated by the Project Manager to be abandoned or relocated, shall be supported and protected at all times from destruction or injury, including damage from freezing, and maintained continuously in service. Should any injury occur while the work is in progress and the structures are under the protection of the Contractor, the Contractor shall fully restore such structures to as good condition as existed before the injury was done. All such support and protection work, and also such alterations of any structures as the Contractor may carry out for the Contractor's own convenience in executing the work, shall be done without additional compensation, unless otherwise specifically provided for in the Contract Documents. The City makes no covenant, representation or warranty as to the right of the

City or the Contractor to carry out any such support or protection work, or any alterations of any structures for the Contractor's own convenience; all such work being in any and all events subject to the consent and approval of the owner or owners of such structures.

85. Structures Interfering with Construction. If, in the course of the work, the Contractor determines that any of the existing structures occupy space required by the structure or its appurtenances to be constructed under the Contract, or that such structures are so situated as to render it impracticable, in the opinion of the Project Manager, to do the work called for under the Contract in the manner specified, the Contractor shall excavate and uncover the portions of such structures in service and shall notify the Project Manager, who will, if reasonably practicable, arrange for the alteration, relocation or removal of the interfering structures or appurtenances within a reasonable time. The Contractor shall not move nor disturb such structures in any way without prior approval by the owners thereof, and the approval of the Project Manager. Any such action by the Contractor shall be at the Contractor's sole cost, risk and expense. Structures belonging to the public utility companies, which are ordered by the Project Manager to be removed or relocated, will be so removed or relocated and permanent supports placed, in general by their owners without cost to the Contractor. The Contractor, however, shall support and protect them up to the time of their removal, shall co-operate with such owners during the process of relocation, and shall maintain and protect such structures if and when such structures are relocated within the Project site or immediately adjacent thereto. Such work shall be done without additional compensation. Sewers, water pipes, electrical conduits, and other City-owned structures shall be altered, relocated, or reconstructed as shown on the Plans or as may be ordered in the course of the work. Payment for this work will be made at the applicable prices in the Contract unless otherwise specifically provided for. If the Project Manager approves a request by the Contractor to effect a temporary or permanent relocation of structures for Contractor's own convenience, and satisfactory arrangements can be made with the owners thereof, the Contractor may carry out such work at its own expense.

86. Abandonment of Structures. In the case of structures the service of which is permanently abandoned, the Project Manager will designate which such structures or portions of such structures the Contractor may salvage and which the Contractor may abandon in place on the Project site, including in the trench. The Contractor shall remove and deliver to a designated point of storage materials salvaged, and payment therefor will be made at the appropriate prices of the Contract, unless otherwise specifically provided. The Contractor shall allow owners of privately owned structures reasonable facilities for salvaging their property. Structures designated as abandoned shall become the property of the Contractor, and shall be removed from the work, unless the Project Manager has approved abandonment of such structures in place on the Project site.

87. Co-operating with Public Utility Companies and City Departments.

a. The Contractor shall at all times during the performance of the work fully comply with the Underground Utility Line Protection Law (Act 287 of 1974, as amended by Act 121 of 2008), 73 P.S. § 176 et seq., otherwise known as the PA One Call System.

b. The Contractor shall co-operate with other contractors and with the employees, officers, and agents of the City Departments or the various public utility companies which own, operate, or have supervision over the underground or above-ground structures encountered by the Contractor, and shall conform to the requirements of the owners of such structures in regard to their safe maintenance. The Contractor shall give to authorized representatives of the City Departments and public utility companies unrestricted access at all times to the excavation and site to inspect the condition and support of their structures at no additional cost to the City. Suitable arrangements shall be provided to facilitate access to valves and manholes if necessary. Ventilation openings shall be provided where gas is likely to accumulate. Where structures are to be constructed by the Contractor under the facilities of any public utility, the Contractor shall make suitable arrangements with the public utility company for the removal or support and maintenance of such facilities at no additional cost to the City.

88. Gas Pipes. Philadelphia Gas Works ("PGW") will make any necessary alterations to the gas mains or gas service pipes, without expense to the Contractor, unless specifically indicated elsewhere in the Contract Documents. PGW will by-pass the gas service in temporary pipes laid outside such excavation, in advance of the construction work. The mains and services that have been removed may be replaced in their permanent position

after the backfilling has been sufficiently compacted.

89. Traffic Control Apparatus. The Contractor acknowledges that the underground location of conduit and cables for traffic signals at intersecting streets is not ordinarily shown on the Plans for the work. Where traffic signals are indicated on the Plans, but the location of connecting conduit or cables for the signals is not shown, the Contractor shall nonetheless assume that there are underground conduits and cables that may affect or interfere with the performance of its work and the Contractor shall adjust its Quote accordingly. The Contractor shall support and maintain in their present locations, or in approved temporary locations, any existing traffic control masts, signals, apparatus, and their connecting underground or above-ground conduits and cables, in such condition as to permit the uninterrupted functioning of the signals during the progress of the work, on temporary poles if necessary, and in a manner satisfactory to the Department of Streets. If the existing signal apparatus is supported on poles and these poles are moved to a temporary location during the progress of the work, the Contractor shall either erect temporary signal poles in the approximate locations of the original poles and erect the signals thereon, or shall extend the electrical connection to the poles as relocated as may be ordered by the Project Manager. Upon the restoration of surface conditions, the Contractor shall restore the equipment, including underground or above-ground conduits and cables and electrical connections, to its original position and condition. This work, except new masonry, shall be done without additional compensation to the Contractor. Masonry piers will be paid for at the applicable unit prices.

90. Vaults. The City will secure the vacating of vaults interfering with the work without expense to the Contractor; but reasonable time shall be allowed the owners for the removal of materials and of any mechanical or other equipment that may be installed therein. These vaults will be vacated to the extent necessary, in the opinion of the Project Manager, to do the work called for under this Contract, including underpinning. The Contractor shall make arrangements with the owners of such vaults in regard to its occupation thereof and shall give the owners at least two (2) weeks' notice of Contractor's intention to remove or break into the walls.

91. Street Lighting Units. Whenever it is necessary to remove, relocate, or adjust street lighting units, or poles, the work shall be reviewed and approved by the City's Department of Streets – Street Lighting Division. All such street lighting work shall be performed at the sole expense of the Contractor and at no additional cost to the City, unless otherwise pre-approved in writing by the Project Manager and the Street Lighting Division.

H. MISCELLANEOUS PROVISIONS

92. Governing Law. The Contract shall be deemed to have been made in Philadelphia, Pennsylvania. The Contract and all disputes arising under the Contract shall be governed, interpreted, construed and determined in accordance with the laws of the Commonwealth, without giving effect to principles of Commonwealth law concerning conflicts of laws.

93. Binding Upon Contractor's Successors, etc. The Contract shall be binding upon the Contractor's heirs, executors, administrators, and successors and assigns and such successors and assigns shall be responsible for the faithful performance and completion of the Contract work.

94. Amendments; Waiver. The Contract may not be amended, supplemented, altered, modified or waived, in whole or in part, except by a written Amendment, or other writing, signed by the Parties, or as provided in Paragraphs 20 and 21 above concerning cancellation of the Contract by the Contractor and termination for convenience by the City, or as provided in Paragraphs 48 and 49 concerning Change Orders and Disputed Change Orders, respectively. Except to the extent that the Parties may have otherwise agreed in writing in an Amendment, or other writing, no waiver, whether express or implied, by either Party of any provision of the Contract shall be deemed: (a) to be a waiver by that Party of any other provision in the Contract; or (b) to be a waiver by that Party of any breach by the other Party of its obligations under the Contract. Any forbearance by a Party in seeking a remedy for any noncompliance or breach by the other Party shall not be deemed to be a waiver of rights and remedies with respect to such noncompliance or breach.

95. Interpretation and Order of Precedence. If the Technical Specifications, the Proposal, or the

Plans expressly modify any of the terms, conditions, or requirements of these Standard Contract Requirements, or of the Department's Standard Details and Specifications, such Technical Specifications, Proposal or Plans shall supersede the portions of these Standard Contract Requirements or the Department's Standard Details and Specifications with which they conflict. The foregoing to the contrary notwithstanding, the City and the Contractor expressly understand that in no event shall the provisions of Paragraph 4 of these Standard Contract Requirements (with respect to test borings, test piles, and existing underground and above-ground structure locations) be superseded by the Technical Specifications, the Proposal, or the Plans.

96. Integration. The Contract Documents, including these Standard Contract Requirements and the exhibits incorporated by reference therein, contain all the terms and conditions agreed upon by the Parties, constitute the entire agreement between the Parties pertaining to the subject matter of the Contract, and supersede all prior agreements, understandings, negotiations and discussions, whether oral or written, of the Parties (except to the extent specifically set forth therein). No other prior or contemporaneous agreements, covenants, representations or warranties, oral or otherwise, regarding the subject matter of the Contract shall be deemed to exist or to bind any Party or vary any of the terms contained in the Contract.

97. No Joint Venture. The Parties do not intend to create, and nothing contained in the Contract shall be construed as creating, a joint venture arrangement or partnership between the City and the Contractor with respect to the work performed by the Contractor under the Contract.

98. No Third Party Beneficiaries. Nothing in the Contract, express or implied, is intended or shall be construed to confer upon or give to any Person, other than the Parties, any rights, remedies, or other benefits, including, but not limited to, third-party beneficiary rights, under or by reason of the Contract. The Contract shall not provide any third party with any remedy, claim, liability, reimbursement, cause of action or other right other than any such remedy, claim, etc. existing without reference to the term of or the existence of the Contract.

99. Severability and Partial Invalidity. The provisions of the Contract shall be severable. If any provision of the Contract or the application thereof for any reason or in any circumstance shall to any extent be held to be invalid or unenforceable, the remaining provisions of the Contract and the application of such provision to Persons, or in circumstances, other than those to which it is held invalid or unenforceable, shall not be affected thereby, and each provision of the Contract shall be valid and enforceable to the fullest extent permitted by law.

100. Survival. Any and all provisions set forth in the Contract which, by its or their nature, would reasonably be expected to be performed after the termination of the Contract or after full performance of the work under the Contract shall survive and be enforceable after such termination. Any and all liabilities, actual or contingent, which shall have arisen in connection with the Contract shall survive the expiration or earlier termination of the Contract, along with the following: the Contractor's warranty of its work, the Contractor's obligation to indemnify, defend and hold harmless the City, its officers, employees and agents; and the Parties' rights and obligations set forth in Paragraph 31 (Proprietary Rights Indemnity).

101. Controlling and Pertinent Statutes. All statutory citations in the Contract shall refer to the pertinent statute as it may be amended hereafter from time to time.

102. Forum Selection Clause; Consent to Jurisdiction. The Parties irrevocably consent and agree that any lawsuit, action, claim, or legal proceeding involving, directly or indirectly, any matter arising out of or related to the Contract shall be brought exclusively in the United States District Court for the Eastern District of Pennsylvania or the Court of Common Pleas of Philadelphia County. It is the express intent of the Parties that jurisdiction over any lawsuit, action, claim, or legal proceeding shall lie exclusively in either of these two (2) forums. The Parties further irrevocably consent and agree not to raise any objection to any lawsuit, action, claim, or legal proceeding which is brought in either of these two (2) forums on grounds of venue or *forum non conveniens*, and the Parties expressly consent to the jurisdiction and venue of these two (2) forums. The Parties further agree that service of original process in any such lawsuit, action, claim or legal proceeding may be duly effected by mailing a copy thereof, by certified mail, postage prepaid, in the case of the Contractor, to the address specified in the Quote, and in the case of the City, to The City of Philadelphia Law Department, Attention:

City Solicitor at the then-current address of the Law Department.

103. Waiver of Jury Trial. The Contractor hereby waives trial by jury in any legal proceeding in which the City is a party and which involves, directly or indirectly, any matter (whether sounding in tort, Contract or otherwise) in any way arising out of or related to the Contract or the relationship created or evidenced thereby. This provision is a material consideration upon which the City relied in entering into the Contract.

104. Headings. The titles, captions or headings of Paragraphs, sections, exhibits or schedules in or to the Contract are inserted for convenience of reference only, and do not in any way define, limit, describe or amplify the provisions of the Contract or the scope or intent of the provisions, and are not a part of the Contract.

105. Days. Any references to a number of days in the Contract shall mean calendar days, unless the Contract specifies Working Days or business days.

106. Notice. All notices, demands, requests, waivers, consents, approvals or other communications which are required or may be given under the Contract shall be in writing and shall be deemed to have been duly made (a) when received or refused if delivered by hand with receipt given or refused; (b) on the next business day if delivered by a nationally recognized overnight courier service (*e.g.*, Federal Express or United Parcel Service); (c) on the date confirmed for receipt by facsimile if delivered by facsimile; and (d) upon receipt or refusal of delivery if sent by certified or registered United States mail, return receipt requested. In each case notices shall be sent, in the case of notices to the Contractor, to the address or addresses set forth in the Contractor's Quote, and in the case of the City, to the address set forth in the City's Notice to Proceed, to the attention of the Project Manager, or to such other address as either Party may specify to the other by a notice complying with the terms of this Paragraph 106.

I. SPECIFIC LAWS

The following provisions are not intended to limit the applicability of any of the other provisions of the Contract:

107. Labor-Management Relationships; Prevailing Wages. The Contract is subject to Section 17-107, as amended, of The Philadelphia Code, "Contractors: Labor-Management Relationships", and all regulations and procedures adopted thereunder.

a. As required by Section 17-107 of The Philadelphia Code all employees performing work under the Contract shall be paid at least the applicable prevailing wages for the respective occupational classifications designated, as set forth in the minimum wage schedule attached as part of the General Bidding and Contract Requirements, and shall be given at least the applicable presently prevailing working conditions during the entire period of work under the Contract. Such working conditions are those which are given to employees pursuant to a bona fide collective bargaining agreement for the applicable craft, trade or industry in the Philadelphia area on the date the General Bidding and Contract Requirements are issued. The occupational classifications for all employees under the Contract shall be only the specific categories of jobs within a given craft, trade or industry for which a separate hourly wage rate for the Philadelphia area is determined by the Secretary of Labor of the United States, in accordance with the provisions of the Davis-Bacon Act, and which are set forth in the applicable schedule attached to the General Bidding and Contract Requirements. In the event that any Contractor believes that work under the Contract should be performed by employees in occupational classifications omitted from the schedule attached to the General Bidding and Contract Requirements, it shall so advise the Managing Director's Office (the "MDO"), Labor Standards Division, which shall remedy the omission if it agrees.

b. The City may withhold from any sums due to the Contractor under the Contract so much as may be necessary to pay the employees the difference between the wages required to be paid under this Paragraph 107 and the wages actually paid to such employees, and the City may make such payments directly to the appropriate employees.

c. Each Contractor shall require all Subcontractors to comply with and be bound by all of the

provisions of this Paragraph of the Contract and of Section 17-107 of The Philadelphia Code, and the Contractor shall insert the requirements of Section 17-107 in all Subcontracts.

d. Every Contractor and Subcontractor shall keep an accurate record preserved on employee time sheets or time cards showing the name, address, social security number, occupational classification, wages and other benefits paid or provided and number of hours worked for each employee assigned to city-work (as "city work" is defined in Section 17-107(1)(b) of The Philadelphia Code), and such record shall be preserved at the current place of business of the employing Contractor or Subcontractor for two (2) years from the date of the Final Estimate on the Contract. The Contractor shall maintain and make his or her accounting and employment records and records relating thereto available for inspection by authorized representatives of the City, at all reasonable hours, and shall permit such representatives to interview employees during the hours on the job, all without prior notice. Neither the Contractor nor any Subcontractor shall allow any employee or other person to interfere with any such inspection or interview.

e. All Contractors and Subcontractors performing city-work shall, upon request of the City, file with the MDO, Labor Standards Division a certified statement setting forth the name, address, occupational classification, wages and other benefits paid or provided and number of hours worked with respect to each employee performing city work. Such statement shall be made weekly for each preceding weekly period. The certification shall affirm that the statement is correct and complete, that the wages set forth therein are not less than those required by the Contract for city-work and that the occupational classification set forth for each employee conforms with the work performed.

f. Nothing herein shall preclude the payment by the Contractor of wages at rates higher than those specified as the minimum in the applicable schedule attached to the General Bidding and Contract Requirements. However, no increase in any Contract price shall be allowed or authorized on account of the payment of wages in excess of those so specified, or on account of wage increases granted hereafter. No increases above the amounts specified in the applicable schedule attached to the General Bidding and Contract Requirements will be required by any Contract during the term thereof except in the case of an error or omission in such schedule. Such an error or omission shall be called to the attention of the MDO, Labor Standards Division as promptly as possible; but the remedying thereof by the Department shall not constitute grounds for withdrawal of a Quote or cancellation of a Contract, nor for an increase in the Contract price or other claim or recovery against the City, nor a ground for failure or refusal to pay the applicable proper minimum to all employees.

g. The minimum wages required hereby shall be paid unconditionally without any subsequent deduction or rebate of any kind except in accordance with Applicable Law governing payroll deductions for taxes, benefits and collective bargaining charges. Any assignment of wages by an employee for the direct or indirect benefit of the Contractor shall constitute a violation of this Paragraph; and any purported release of rights under Section 17-107 of The Philadelphia Code by an employee shall be void and of no effect.

h. The Parties shall refer to Section 17-107 of The Philadelphia Code, and to the regulations to be issued from time to time by the MDO, Labor Standards Division, for further information concerning the administration of the foregoing requirements of this Paragraph 107. In addition, it shall be the responsibility of all Sellers and Contractors to inform themselves as to all prevailing working conditions, including, without limitation, length of work day and work week, overtime compensation, and holiday and vacation rights.

108. Non-Discrimination; Fair Practices.

a. The Parties acknowledge that they have entered into and perform the Contract under the terms of the Philadelphia Home Rule Charter, as it may be amended from time to time, and in performing the Contract, the Contractor shall not discriminate or permit discrimination against any individual because of race, color, religion or national origin. In addition, the Contractor shall, in performing the Contract, comply with the provisions of the Fair Practices Ordinance of The Philadelphia Code (Chapter 9-1100, as amended) and the Mayor's Executive Order No. 4-86, as each may be amended from time to time, both of which prohibit, among other things, discrimination against individuals because of race, color, sex, sexual orientation, religion, national origin, ancestry, age, handicap (including but not limited to Human Immunodeficiency Virus infection), marital

status, presence of children or source of income, in employment, housing and services in places of public accommodation. In the event of any breach of this Paragraph 108, the City may, in addition to any other rights or remedies available under the Contract, at law or in equity, suspend or terminate the Contract forthwith.

b. In accordance with Act 57 of 1998, 62 Pa.C.S. §3701, as amended, in the hiring of employees for the performance of work under the Contract or any Subcontract, neither the Contractor, nor any of its Subcontractors, nor any Person acting in their behalf shall discriminate, by reason of gender, race, creed, or color, against any citizen of the Commonwealth who is qualified and available to perform the work to which the employment relates. In addition, neither the Contractor, nor any of its Subcontractors, nor any Person acting in their behalf shall in any manner discriminate against or intimidate any employee hired for the performance of work under the Contract on account of gender, race, creed, or color. In addition to any other remedies available to the City, the Contract may be cancelled or terminated by the City and all money due on or to become due under the Contract may be forfeited for a violation of the terms or conditions of this Paragraph 108(b).

109. Employment of Low - and Moderate - Income Persons. The Contract is subject to Section 17-1000, as amended, of The Philadelphia Code, "Employment of Low- and Moderate-Income Persons by City Contractors", and all regulations and procedures adopted thereunder.

a. As required by Section 17-1000 of The Philadelphia Code, for all construction and demolition contracts entered into by the City with a total value in excess of \$150,000 (a "Covered Construction Contract"), the Contractor must certify to the Procurement Department that at least forty percent (40%) of the workers who work on a Covered Construction Contract are low- or moderate-income persons. Apprentices and those working in on-the-job training positions shall be considered workers for the purpose of meeting the requirements of Section 17-1000.

b. A low- or moderate-income person is defined under Section 17-1000 as a person whose income does not exceed more than eighty percent (80%) of the median income for the Philadelphia metropolitan area, as determined or adjusted by the Secretary of Housing and Urban Development pursuant to 42 U.S.C. §5302(a)(20), as amended. A person who no longer meets the income eligibility criteria set forth in Section 17-1000 because of employment by a party to a Covered Construction Contract, but who met the criteria on his or her date of hire, shall be deemed a low- or moderate-income person for three years from the date of hire.

c. Each Contractor shall require all Subcontractors to comply with and be bound by all of the provisions of this Paragraph of the Contract and of Section 17-1000 of The Philadelphia Code, and the Contractor shall insert the requirements of Section 17-1000 in all Subcontracts.

110. Ethics Requirements. To preserve the integrity of City employees and maintain public confidence in the competitive bidding system, the City intends to vigorously enforce the various ethics laws as they relate to City employees in the bidding and execution of contracts to which the City is a party. Such laws are in three categories:

a. Executive Order No. 02-04, which prohibits City employees from soliciting or accepting anything of value from any Person seeking to initiate or maintain a business relationship with the City, including but not limited to any of its departments, boards, commissions or agencies. All City employees presented with gifts or gratuities as indicated in Executive Order 02-04 have been instructed to report these actions to the appropriate authorities. All Sellers, agents or intermediaries who are solicited for gifts or gratuities by City employees are urged to report these actions to the appropriate authorities, including but not limited to the Inspector General.

b. Section 10-102, as amended, of the Philadelphia Home Rule Charter, which prohibits any Quote from being accepted from, or contract awarded to any City employee or official, or any firm in which a City employee or official has a direct or indirect financial interest. All Sellers are required to disclose any current City employees or officials who are employees or officials of the Seller's firm, or who otherwise would have a financial interest in the Contract.

c. The State Ethics Act and the City Ethics Code, which prohibit a public employee from using

his or her public office or any confidential information gained thereby to obtain financial gain for himself or herself, a member of his or her immediate family, or a business with which he or she or a member of his or her immediate family is associated. "Use of public office" is avoided by the employee or official publicly disclosing the conflict and disqualifying himself or herself from official action in the matter, as provided in The Philadelphia Code §20-608, as amended.

111. The Philadelphia Code, Chapter 17-400.

a. In accordance with Chapter 17-400 of The Philadelphia Code, as it may be amended from time to time, Contractor agrees that its payment or reimbursement of membership fees or other expenses associated with participation by its employees in an exclusionary private organization, insofar as such participation confers an employment advantage or constitutes or results in discrimination with regard to hiring, tenure of employment, promotions, terms, privileges or conditions of employment on the basis of race, color, sex, sexual orientation, religion, national origin or ancestry, constitutes, without limiting the generality of Paragraph 32 (Default and Remedies), a substantial breach of the Contract entitling the City to all rights and remedies provided herein or otherwise available at law or in equity.

b. The Contractor agrees to include the immediately preceding subparagraph, with appropriate adjustments for the identity of the parties, in all Subcontracts which are entered into for work to be performed pursuant to the Contract.

c. The Contractor agrees to cooperate with the City's Commission on Human Relations in any manner which the Commission deems reasonable and necessary for the Commission to carry out its responsibilities under Chapter 17-400 of The Philadelphia Code. The Contractor's failure to so cooperate shall constitute, without limiting the applicability of Paragraph 32 (default and remedies), a substantial breach of the Contract entitling the City to all rights and remedies provided herein or otherwise available at law or in equity.

112. Federal Laws. The Contractor shall comply with the provisions of Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d – 2000d7), section 504 of the Federal Rehabilitation Act of 1973 (29 U.S.C. § 794), The Age Discrimination Act of 1975, (42 U.S.C. §§ 6101 – 6107), Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681), and 45 C.F.R. Part 92, as they may be amended from time to time, which together prohibit discrimination on the basis of race, color, national origin, sex, handicap, age and religion.

113. Americans With Disabilities Act. Contractor understands and agrees that no individual with a disability shall, on the basis of the disability, be excluded from participation in the Contract or from activities or services provided under the Contract. As a condition of accepting and executing the Contract, Contractor shall comply with all provisions of the Americans With Disabilities Act (the "ADA"), 42 U.S.C. §§ 12101 – 12213, as amended, and all regulations promulgated thereunder, as the ADA and regulations may be amended from time to time, which are applicable (a) to Contractor, (b) to the benefits, services, activities, facilities and programs provided in connection with the Contract, (c) to the City, or the Commonwealth, and (d) to the benefits, services, activities, facilities and programs of the City or of the Commonwealth, and, if any funds for payments by the City or otherwise under the Contract are provided by the federal government, which are applicable to the federal government and its benefits, services, activities, facilities and programs. Without limiting the applicability of the preceding sentence, Contractor shall comply with the "General Prohibitions Against Discrimination," 28 C.F.R. Part 35.130, and all other regulations promulgated under Title II of the ADA, as they may be amended from time to time, which are applicable to the benefits, services, programs and activities provided by the City through Contracts with outside contractors.

114. The Philadelphia Code, Section 17-104. In accordance with Section 17-104, as amended, of The Philadelphia Code, the Contractor, by execution of this Contract, certifies and represents that (1) the Contractor (including any parent company, subsidiary, exclusive distributor or company affiliated with Contractor) does not have, and will not have at any time during the term of the Contract (including any extensions thereof), any investments, licenses, franchises, management agreements or operations in Northern Ireland and (2) no product to be provided to the City under the Contract will originate in Northern Ireland, unless the Contractor has implemented the fair employment principles embodied in the MacBride Principles.

a. In the performance of the Contract, the Contractor agrees that it will not utilize any suppliers, Subcontractors or subconsultants at any tier (1) who have (or whose parent, subsidiary, exclusive distributor or company affiliate have) any investments, licenses, franchises, management agreements or operations in Northern Ireland or (2) who will provide products originating in Northern Ireland unless said supplier, subconsultant or Subcontractor has implemented the fair employment principles embodied in the MacBride Principles.

b. The Contractor agrees to cooperate with the City's Director of Finance in any manner which the said Director deems reasonable and necessary to carry out the Director's responsibilities under Section 17-104 of The Philadelphia Code. The Contractor expressly understands and agrees that any false certification or representation in connection with this Paragraph and any failure to comply with the provisions of this Paragraph shall constitute a substantial breach of the Contract entitling the City to all rights and remedies provided in the Contract or otherwise available at law (including, but not limited to, Section 17-104 of The Philadelphia Code) or in equity. In addition, the Contractor acknowledges and understands that false certification or representation is subject to prosecution under Title 18 Pa.C.S. §4904, as amended, concerning unsworn falsification to authorities.

115. Steel Products Procurement Act. The Steel Products Procurement Act, 73 P.S. § 1881, et seq., as amended, shall govern payments to the Contractor under the Contract. In seeking payment under the Contract, the Contractor represents, warrants and covenants that only steel products made in the United States as defined by the Steel Products Procurement Act have been used or supplied in the performance of the Contract and all Subcontracts thereunder. Where unidentified steel products are supplied or used under the Contract, the City will not authorize, provide for, or make any payments to the Contractor for such steel products, unless and until the Contractor shall first provide to the Project Manager documentation, including, but not limited to, invoices, bills of lading, and mill certification, attesting that the steel was melted and manufactured in the United States. Where a steel product is identifiable from its face, the City will authorize, provide for, and make payments to the Contractor for such steel products, only after the Contractor shall have submitted a certification, in a form satisfactory to the Project Manager, that the Contractor has fully complied with the requirements of the Steel Products Procurement Act. Where the Project Manager has determined, in writing that a particular steel product is not produced in the United States in sufficient quantities to satisfy the requirements of the Contract, then this Paragraph shall not apply to payments for that steel product. Failure of the Contractor to comply with the Steel Products Procurement Act shall constitute a violation of the Contract which shall entitle the City to exercise all rights and remedies provided to it by the Steel Products Procurement Act and provided to it under the Contract, either at law or in equity.

116. Business, Corporate and Slavery Era Insurance Disclosure. In accordance with Section 17-104, as amended, of The Philadelphia Code, the Seller, after execution of the Contract, will complete an affidavit certifying and representing that the Seller (including any parent company, subsidiary, exclusive distributor or company affiliated with Seller) has searched any and all records of the Seller or any predecessor business entity regarding records of investments or profits from slavery or slaveholder insurance policies during the slavery era. The names of any slaves or slaveholders described in those records must be disclosed in the affidavit.

The Seller expressly understands and agrees that any false certification or representation in connection with this Paragraph and/or any failure to comply with the provisions of this Paragraph shall constitute a substantial breach of this Contract entitling the City to all rights and remedies provided in this Contract or otherwise available in law (including, but not limited to, Section 17-104 of The Philadelphia Code) or equity and the contract will be deemed voidable. In addition, it is understood that false certification or representation is subject to prosecution under Title 18 Pa.C.S.A. Section 4904, as amended, concerning unsworn falsification to authorities.

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**City of Philadelphia
Economic Opportunity Plan**

**HEALTH CARE CENTER NO. 10
INTERIOR IMPROVEMENTS AND ADDITIONS**

I. Introduction, Definitions, Goals and Diversity Practices

The City of Philadelphia, acting through its offices of the Division of Housing and Community Development (“DHCD”) and Office of Economic Opportunity (“OEO”) (collectively, “City”) and the Philadelphia Redevelopment Authority (“PRA”) strongly encourage the use of certified Minority (“MBE”), Women (“WBE”), Disabled (“DSBE”) and Disadvantaged¹ (“DBEs”) Business Enterprises (collectively, “M/W/DSBEs”) and minority and female workers in all aspects of the development and use of a parcel(s) of land located at **HEALTH CARE CENTER NO. 10, 2230 COTTMAN AVENUE, PHILADELPHIA, PA 19149** which may include financial investment, design, construction and operations (Project). In support of this objective, City and PRA will require that the _____ (“Contractor”) of this parcel commit to this Economic Opportunity Plan (“EOP” or “Plan”) as required by Section 17-1602 of The Philadelphia Code, as amended.

This Plan contains ranges of projected M/W/DSBE utilization and goals for the employment of minority and female workers in connection with the Project. Contractor shall cause this Plan to be made part of and incorporated into all bids, proposals and solicitations and any resulting agreement(s) entered into between Contractor and any participant in connection with the development and use of the parcel. By submission of this Plan, Contractor makes a legally binding commitment to the City and PRA to abide by the provisions of this Plan which include its commitment to exercise its Best and Good Faith Efforts throughout the project and its commitment to cause its participants to use their Best and Good Faith Efforts to provide subcontracting opportunities for M/W/DSBEs in all phases of the project and to employ a diverse workforce. This Plan expressly applies to all contracts awarded in connection with the Project.

Neither Contractor nor any participant shall discriminate on the basis of race, color, religion, sex, national origin, sexual orientation, gender identity, ancestry, age, or handicap in the award and performance of contracts pertaining to this Plan. Contractor has summarized its current and past practices relating to Contractor’s diversity practices (“Diversity Practices Statement”). This statement, included as Attachment “A” to this Plan, identifies and describes Contractor’s processes used to develop diversity at all levels of Contractor’s organization including, but not limited to, board and managerial positions. This Diversity Practices Statement summarizes Contractor’s strategic business plans specific to its current or past practices of M/W/DSBE utilization on its government and non-government projects and procurement activities. Contractor further agrees to identify any “Equity Ownership” held in connection with this Project which shall mean the percentage of beneficial ownership in the Contractor’s organization or development team that is held by minority persons, women and disabled persons. In the event Equity Ownership is identified, Contractor agrees to abide by the reporting requirements enumerated in Section 17-1603 (1)(g)(.3).

¹Disadvantaged Business Enterprises (“DBEs”) are those socially or economically disadvantaged minority and woman owned businesses certified under 49 C.F.R. Part 26.

Contractor hereby verifies that all information submitted to the City in response to this Plan, is true and correct and is notified that the submission of false information is subject to the penalties of 18 Pa.C.S. Section 4904 (relating to unsworn falsification to authorities) and 18 Pa.C.S. Section 4107.2 (a)(4) (relating to fraud in connection with minority business enterprises or women's business enterprises).

For the purposes of this Plan, MBE, WBE, DBE and DSBE shall refer to certified businesses so recognized by OEO. Only the work or supply effort of firms that are certified as M/W/DSBEs by an OEO approved certifying agency² will be eligible to receive credit as a Best and Good Faith Effort. In order to be counted, certified firms must successfully complete and submit to the OEO an application to be included in the OEO Registry which is a list of registered M/W/DSBEs maintained by the OEO and available online at www.phila.gov/oEO/directory.

For this Plan, the term “Best and Good Faith Efforts,” the sufficiency of which shall be in the sole determination of the City, means: efforts, the scope, intensity and appropriateness of which are designed and performed to foster meaningful and representative opportunities for participation by M/W/DSBEs and an appropriately diverse workforce and to achieve the objectives herein stated. Best and Good Faith Efforts are rebuttably presumed met, when commitments are made within the M/W/DSBE Participation Ranges established for this development and a commitment is made to employ a diverse workforce as enumerated herein.

II. Goals

A. M/W/DSBE Participation Ranges

The City of Philadelphia has established a citywide goal of 35% M/W/DSBE utilization as informed by its Annual Disparity Study.³ This citywide goal should be used as a benchmark for the Contractor’s expression of Best and Good Faith Efforts which are efforts taken by Contractor to provide meaningful and representative opportunities for M/W/DSBEs in the Project. For this project, in the absence of discrimination in the solicitation and selection of M/W/DSBEs, the percentage of MBE, WBE and DSBE participation that is reasonably attainable through the exercise of Best and Good Faith Efforts is stated below as participation ranges. These percentages relate to the good faith estimated cost of the entire Project. In order to maximize opportunities for as many businesses as possible, a firm that is certified in two or more categories (e.g. MBE and WBE and DSBE or WBE and DSBE) will only be credited toward one participation range as either an MBE or WBE or DSBE. The firm will not be credited toward more than one category. These ranges are based upon an analysis of factors such as the size and scope of the development and the availability of MBEs, WBEs, DSBEs and DBEs to participate in this Project:

MBE	WBE
18%	7%

²A list of “OEO approved certifying agencies” can be found at www.phila.gov/oEO

³ The City of Philadelphia FY’16 Annual Disparity Study recommends an overall goal of 35% based upon an analysis of FY’16 utilization and availability.

B. Workforce Goals for a Diverse Workforce

As a benchmark for the expression of “Best and Good Faith Efforts” to provide meaningful and representative opportunities for diverse workers in the Project, the following goals have been established for the employment of minority persons and females in the Project workforce of apprentices and journeymen at the following levels⁴:

African American Journeypersons – 22% of all journey hours worked across all trades

Asian Journeypersons – 3% of all journey hours worked across all trades

Hispanic Journeypersons – 15% of all journey hours worked across all trades

Female Journeypersons – 5% of all journey hours worked across all trades

Minority Apprentices – 50% of all hours worked by all apprentices

Female Apprentices – 5% of all hours worked by all apprentices

III. Responsiveness

A. Contractor shall, and shall cause its participants to identify all M/W/DSBE commitments and agree to employ a diverse workforce on the form entitled, “M/W/DSBE Participation and Workforce Commitments.” The commitments on this form constitute a representation that the identified M/W/DSBE is capable of providing commercially useful goods or services relevant to the commitments and that the Contractor and its participants have entered into legally binding agreements with the listed M/W/DSBEs for the work or supply effort described and the dollar/percentage amount(s) set forth on the form. In calculating the percentage of M/W/DSBE participation, the standard mathematical rules apply in rounding off numbers. In the event of inconsistency between the dollar and percentage amounts listed on the form, the percentage will govern.

B. M/W/DSBE commitments are to be memorialized in a written subcontract agreement. Letters of intent, quotations, contracts, subcontracts and any other documents evidencing commitments with M/W/DSBEs, including the M/W/DSBE Participation and Workforce Commitments Form, become part of and an exhibit to this Plan.

C. DHCD will review the M/W/DSBE Participation and Workforce Commitments Form for the purpose of determining whether Best and Good Faith Efforts have been made. DHCD reserves the right to request further documentation and/or clarifying information at any time during the construction and development of the Project.

D. If Contractor, its participants or any subsequent developer makes any changes in contracts that have been reviewed by DHCD under the Plan, or if Contractor at the time of Closing has not yet identified contracts entered into for the development of the Project, then Contractor, its participants or any subsequent developer shall have the obligation to inform DHCD of any changes to the approved Plan and shall use Best and Good Faith efforts to use M/W/DSBEs for any new contracts.

⁴ These goals are informed by the City of Philadelphia’s annual disparity assessment of workforce diversity, the “Economic Opportunity Plan Employment Composition Analysis Fiscal Year 2016.”

IV. Compliance and Monitoring of Best and Good Faith Efforts

A. A hard copy of this Plan, as certified below by OEO, shall be filed with the Chief Clerk of City Council within fifteen (15) days of Closing. The Plan shall be filed with:

Michael Decker, Chief Clerk of City Council
Room 402 City Hall
Philadelphia, Pennsylvania 19107

B. Contractor and its participants agree to cooperate with DHCD in its compliance monitoring efforts, and to submit, upon the request of DHCD, documentation relative to their implementation of the Plan, including the items described below:

- Copies of signed contracts and purchase orders with M/W/DSBE subcontractors;
- Evidence of payments (cancelled checks, invoices, etc.) to subcontractors and suppliers to verify participation; and
- Telephone logs and correspondence relating to M/W/DSBE commitments.
- To the extent required by law, the Contractor and its participants shall ensure that all its on-site contractors maintain certified payrolls which include a breakout of hours worked by minority and female apprentices and journeymen; these documents are subject to inspection by the City.

C. Prompt Payment of M/W/DSBEs

1. The Contractor and its participants agree and shall cause all its contractors to ensure that all M/W/DSBEs participating in the Project receive payment for their work or supply effort within five (5) business days after receipt of a proper invoice following satisfactory performance.

D. Oversight Process

1. Where the dollar value of development is in excess of Five Million Dollars (\$5,000,000), the Plan shall establish a Project Oversight Committee, consisting of, as appropriate, the contractor, developer or recipient of financial assistance and representatives of the Contractor, PRA, OEO, DCHD, City Council, and appropriate community organizations. Such Committee shall meet regularly, beginning no later than the initiation of the design phase of the project, and shall be responsible for facilitating compliance with the Plan. OEO will implement the Oversight Process, as required by Section 17-1603(b) of The Philadelphia Code. The Oversight Committee, through the Oversight Process, shall have within its purview the reconciliation of all compliance related issues or grievances. The Oversight Committee Process, as needed, will involve convening individual consultation or periodic small group meetings to include any or all of the constituent parties.

V. Remedies and Penalties for Non-Compliance

A. The Contractor acknowledges and agrees that its compliance with the requirements of this Plan is a material inducement for the Ordinance of City Council and Contractor's failure to substantially comply with the Plan may result in enforcement actions and the imposition of penalties as authorized by Sections 17-1605 and 17-1606 of The Philadelphia Code. Notwithstanding the foregoing, no privity of contract exists between PRA, the City and any M/W/DSBE identified in any contract resulting from implementation of the Plan. Neither PRA nor the City intends to give or confer upon any such M/W/DSBE any legal rights or remedies in connection with subcontracted services under any law or policy or by any reason of any contract resulting from implementation of the Plan except such rights or remedies that the M/W/DSBE may seek as a private cause of action under any legally binding contract to which it may be a party.

PRINT NAME OF CONTRACTOR DATE

SIGNATURE OF CONTRACTOR DATE

LYNN NEWSOME, DHCD COMPLIANCE DIRECTOR DATE

IOLA HARPER, DIRECTOR, OFFICE OF ECONOMIC OPPORTUNITY⁵ DATE

⁵ Pursuant to Section 17-1603 (2) of The Philadelphia Code, the representative of the City of Philadelphia's Office of Economic Opportunity, the "certifying agency", certifies that the contents of this Plan are in compliance with Chapter 17-1600.



CITY OF PHILADELPHIA PREVAILING WAGE RATES

Contractors and their subcontractors are required to submit weekly certified payrolls “WH347” to the Philadelphia Redevelopment Authority Wage Compliance Department, Attn: Mary Fogg. Failure to pay Prevailing Wage, as applicable, or to submit certified payroll records is a substantial breach of Contract and may be subject to fines and penalties as prescribed by Section 17-107 of The Philadelphia Code which may include withholding from any sums due to the Contractor under the Contract so much as may be necessary to pay the employees the difference between the wages required to be paid hereunder and the wages actually paid to such employees, and the Philadelphia Redevelopment Authority may make such payments directly to the appropriate employees. For any questions please contact Alberta Burton-Benn, Director, Wage Compliance, 215-448-3025, alberta.burton-benn@phcd.phila.gov

*Updated Wages Rates will be issued at the Pre-Construction Meeting.

**PREVAILING WAGE RATE SCHEDULE
 FOR CONSTRUCTION WORK DONE ON BEHALF OF CITY OF PHILADELPHIA
 INCLUDING REPAIR, ALTERATION, AND REMODELING WORK**

I. BUILDING CONSTRUCTION

A. Job Classification and Wage Rates

	Basic Hourly Rate	Fringe Benefits
ASBESTOS WORKER		
Journeyman	51.20	36.95
Handler Level 1	28.59	22.69
Handler Level 2	40.92	22.69
BOILERMAKER	47.21	34.11
BRICKLAYER	43.45	29.96
CARPENTER	47.99	28.74
CEMENT MASON	38.50	32.81
(as of 5/1/20)	38.50	34.31
DRY WALL FINISHER	39.47	28.89
ELECTRICIAN	59.79	38.95
(Telecommunication Senior Tech)	57.78	27.22
(Telecommunication Tech A)	53.28	26.33
ELEVATOR CONSTRUCTOR	55.76	33.005

FOOTNOTES FOR ELEVATOR MECHANICS:

A. PAID VACATION: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% for 6 months to 5 years of service.

B. Eight Paid Holidays (provided employee has worked 5 consecutive days before and the working day after the holiday): New Year's Day; Memorial Day; Independence Day; Labor Day; Veteran's Day; Thanksgiving Day and the Friday after Thanksgiving Day, and Christmas Day.

GLAZIER	43.87	33.38
IRONWORKER		
Structural & Ornamental	49.30	34.41
Reinforcing (Rodsetter)	46.41	30.85
Rigger & Machinery Mover	44.15	28.72
LABORER		
Journeyman Class One	31.65	26.62
Journeyman Class Two	31.75	26.62
Journeyman Class Three	31.80	26.62
Journeyman Class Four	31.95	26.62
Journeyman Class Five	32.05	26.62
Journeyman Class Six	31.79	26.62
Journeyman Class Seven	32.90	26.62

Journeyman Class Eight	32.95	26.62
Prevailing Wage Schedule (Effective 10/31/2019)		
Building Construction (cont'd)		
Journeyman Class Nine	33.05	26.62
Journeyman Class Ten	33.20	26.62
Journeyman Class Eleven	33.45	26.62
Journeyman Class Twelve	32.02	26.62
LABORER: ASBESTOS ABATEMENT, LEAD ABATEMENT, TOXIC WASTE HANDLING, HAZARDOUS WASTE HANDLING		
MASTER ABATEMENT TECHNICIAN	33.15	26.50
LANDSCAPE LABORER		
Class I	24.64	23.68
Class II	24.64	23.68
LATHER	47.99	29.92
LINE CONSTRUCTION		
Lineman	53.64	27.46
(as of 5/27/19)	54.66	28.56
Winch Truck Operator	37.55	22.63
(as of 5/27/2019)	38.26	23.47
Line Truck Driver	34.87	21.82
(as of 5/27/2019)	35.53	22.62
Ground hand	32.18	21.01
(as of 5/27/2019)	32.80	21.78
Watch/Flag Person	22.94	18.24
(as of 5/27/2019)	23.37	18.85
MARBLE SETTER	43.25	29.60
MARBLE FINISHER	37.07	26.85
MILLWRIGHT	45.40	33.29
PAINTER		
Brush & Roller	39.04	28.99
Spray, Steel, & Swing	40.89	27.64
Bridges	55.52	28.39
PILEDRIVERMAN	43.45	34.57
(Diver)	52.14	34.47
(Diver Tender)	43.45	34.47
PLASTERER	40.12	30.75
(as of 5/1/2020)	40.12	31.24
PLUMBER	55.45	34.54
POINTER, CAULKER, & CLEANER	44.75	28.70
POWER EQUIPMENT OPERATOR		
Group One	46.41	30.60
Group One A	49.41	31.49
Group Two	46.16	30.53
Group Two A	49.17	31.41
Group Three	42.08	29.72
Group Four	41.78	29.23

Group Five	40.06	28.72
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Prevailing Wage Schedule (Effective 10/31/2019)
 Building Construction (cont'd)

Group Six	39.07	28.43
Group Seven A	56.30	35.11
Group Seven B	56.00	35.03

*****TOXIC/HAZARDOUS WASTE REMOVAL*****

Add 20 percent to basic hourly rate for all classifications

ROOFER	37.15	31.27
Shingle, Slate and Tile	27.50	20.37
SHEET METAL WORKER	49.79	42.89
(Sign Makers and Hangers)	25.03	21.41
SOFT FLOOR LAYER (Resilient Floor)	48.61	28.69
(as of 5/1/20)	48.61	30.44
SPRINKLER FITTER	57.20	28.32
STEAM FITTER	56.37	37.79
STONE MASON	43.25	29.60
Surveying and Layout		
(Chief of Party)	55.19	28.19
(as of 5/1/20)	55.19	29.92
(Instrument Person)	47.99	28.19
(as of 5/1/20)	47.99	29.92
(Rodman)	24.00	19.94
(as of 5/1/20)	24.00	20.81
TERRAZZO MECHANIC	46.50	27.52
TERRAZZO FINISHER (Grinder)	41.23	25.52
TERRAZZO FINISHER (Finisher)	40.96	25.52
TILE SETTER	46.50	27.52
TILE FINISHER	37.07	26.85
TRUCK DRIVER		
Journeyman Class I	32.21	19.185
Journeyman Class II	32.31	19.185
Journeyman Class III And Low Boy	32.58	19.185
WALL COVERER	39.42	28.99
WELDER - Rate for craft to which, welding work is incidental.		

B. Job Classification Definitions: Building Construction,

1. Laborer Classifications:

Class One: Strip concrete, dismantle concrete, load, unload, handle and/or transport reinforced steel and steel mesh, carry lumber, handle miscellaneous building materials operate jack hammers, use paving breakers and other pneumatic tools, build scaffolds, perform raking, handle asphalt, perform spading and concrete pit work, perform grading, perform form pinning or shorting, perform demolition work with exception of burners, lay conduits, lay ducts, perform sheating or lagging, lay non-metallic pipe, perform caulking.

Class Two: Power Buggies, Burners on Demolition.

Class Three: Wagon drill operator (single)

Class Four: Powderman, wagon drill operator (multiple), perform circular caissons excavations, caisson groundman, perform underpinning excavation, perform laborers' work at depth of eight (8) feet or below.

Class Five: Caisson bottom worker.

Class Six: Yard worker.

Class Seven: Trackmen, Brakemen, Groutmen, Bottom Shaft Men, All Other Men in Free Air Tunnels.

Class Eight: Caisson Foreman

Class Nine: Miner Helper, Form Setters.

Class Ten: Miners Bore Driver, Blasters, Drillers, Pneumatic Shield Operator.

Class Eleven: Welders & Burners.

Class Twelve: Mason Tenders

Landscape Laborers:

Class I: Landscape laborer

Class II: Farm tractor driver, hydro seeder, mulched nozzle worker, backhoe operator, bulldozer crawler type loader, tree crane operator.

Laborer - Lather and Plasterer: Wheel and/or hod carry any lather and plaster materials used by lathering and plastering contractors' build scaffolds; build runways; perform clean-up and removal of debris as covered by lathering and plastering contractor's contract; deliver any material used by lathering and plastering contractor, from curbside to building and back, unless motor vehicles are permitted to enter building with required materials; all mortar designated for use by plasterer shall be carried via wheel barrow or hod; all plastering and fire proofing machines, as well as guns and mixers requiring the assistance of a worker other than plasterer operator, shall be manned by helper (tender).

2. Truck driver classifications:

Class I: Helper, stake body truck operator (single axle, dumpster).

Class II: Dump truck operator, tandem truck operator, batch truck operator, semi-trailer truck operator, agitator-mixer truck operator, dump Crete type vehicle operator, asphalt distributor, farm tractor operator (when tractor used to transport materials), stake body truck (tandem) operator.

Class III: Euclid type; off highway equipment back truck operator; belly dump truck operator; double-hitched equipment trailer operator; straddle carrier (Ross) operator; low-

bed trailer truck operator.

3. Power Equipment Operator Classifications – Building

Group One:

Handling steel and stone in connection with erection Cranes doing hook work

Prevailing Wage Schedule (Effective 10/31/2019)

Building Construction (cont'd)

Any machines handling machinery

Cable spinning machine

Helicopters

Concrete Pumps (building)

Machines similar to above, including remote control equipment

Group One A:

Handling steel and stone in connection with erection.

Cranes doing hook work

Any machines handling machinery

Concrete Pumps (Building)

High Rail/Burro Crane

Rail Loader (Winch Boom Type)

All equipment in this group which previously received the hour in lieu of an oiler will receive Wage Group I (A). Equipment in this Wage Group that does not require an oiler.

Machines similar to above, including remote control equipment

Group Two:

All types of cranes

All types of backhoes

Cableways

Draglines

Keystones

All types of shovels

Derricks

Pavers 21E and over

Trenching machines

Trench shovels

Gradalls

Front- end Loaders

Boat Captain

Hoist with Two Towers

Building Hoists-double drum (unless used as a single drum)

Pippin type backhoes

Tandem scrapers

Tower type crane operation erecting dismantling jumping or jacking

Drills self-contained (Drillmaster type)

Fork lift (20ft. and over)

Motor Patrols (fine grade)

Batch Plant with Mixer

Carryalls, Scrapers, Tournapulls

Roller (High Grade Finishing)

Spreaders (Asphalt)

Bulldozers and Tractors

Mechanic-Welder

Conveyor Loaders (Euclid-Type Wheel)
Concrete Pumps (Heavy Highway)
Milling Machine
Bobcat
Side Boom
Prevailing Wage Schedule (Effective 10/31/2019)
Building Construction (cont'd)

Directional Boring Machines
Vermeer Saw Type Machine (other than hand held)
Tractor Mounted Hydro Axe
Chipper with boom
All Autograde and concrete finishing machines
Bundle Pullers/Extractors (Tubular)

Machines similar to the above including remote control equipment

*Surcharge

Group Two (A):

Crawler backhoes and Crawler gradalls over one (1) cubic yard factory rating
Hydraulic backhoes over one (1) cubic yard factory rating
Single person operation truck cranes 15 ton and over factory rating
Cherry picker type machinery and equipment 15 ton and over factory rating, etc.
Cranes doing hook work will be paid Wage Group I (A).
All equipment in this Group which previously received the hour in lieu of an oiler will receive Wage Group II (A) including concrete pumps (Heavy/Highway).

Machines similar to the above including remote control equipment

*Surcharge

Group Three:

Asphalt Plant Engineers
Conveyors (except building conveyors)
Well Driller
Forklift Trucks of all types
Ditch Witch (small trenchers)
Motor Patrols
Fine Grade machines
Rollers
Concrete Breaking Machines (Guillotine Only)
Stump Grinder
High or Low Pressure Boilers
Building Hoist (single drum)
Elevator Operator (New Construction)
Machines similar to above including remote control equipment

Group Four:

Seamen Pulverizing Mixer
Form Line Graders
Farm Tractors
Road Finishing Machines
Concrete Spreaders (Heavy Highway)
Power Broom (self-contained)
Seed Spreader
Grease Truck

Machines similar to the above including remote control equipment

Group Five:

Compressors

Pumps

Well pint pumps

Conveyors (Building)

Prevailing Wage Schedule (Effective 10/31/2019)

Building Construction (cont'd)

Welding Machines

Heaters

Tireman, Power Equipment

Maintenance Engineers (Power Boats)

Miscellaneous Equipment

Operator

Elevator Operator (Renovations)

House Car

Machines similar to above including remote control equipment

Group Six:

Fireman

Oilers and Deck Hands (Personnel Boats)/Grease Truck Helpers

*Surcharge

Group Seven (A):

Handling steel and stone in connection with erection

Cranes doing hook work

Any machines handling machinery

Cable spinning machine

Helicopters

Concrete pumps (Building)

High Rail/Burro Crane

Rail Loader (Winch Boom Type)

Machines similar to above, including remote control equipment

Group Seven B

All types of cranes

All types of backhoes

Cableways

Conveyor Loader (Euclid-Type Wheel)

Drag Lines

Keystones

All types of shovels

Derricks

Pavers 21E and over

Trench shovels

Trenching machines

Gradalls

Front-end Loaders

Boat Captain

Hoist with two towers

Concrete Pumps (Heavy, Highway)

Building Hoists-double drum (unless used as a single drum)

Milling Machine
Mucking Machines in Tunnel
Pippin type backhoes
Bobcat
Tandem scrapers
Side Boom
Tower type crane—operation, erecting, dismantling,
Prevailing Wage Schedule (Effective 10/31/2019)
Building Construction (cont'd)

Jumping or jacking
Directional Boring Machines
Vermeer Saw Type Machine (other than hand held)
Drills self-contained (Drillmaster type)
Fork Lift (20 ft. & over)
Track or Mounted Hydro Axe
Motor Patrols (Fine Grade)
Chipper with boom
Batch Plant with Mixer
All autograde and concrete finishing machines
Carryalls, Scapers & Tournapulls
Rollers (High Grade Finishing)
Bundle Pullers/Extractors (Tubular)
Spreaders (Asphalt)
Bulldozers and Tractors
Mechanic – Welders
Production Switch Tamper
Ballast Regulators
Tie Replacer
Rail/Road Loader
Power Jack liner
Machines similar to above, including remote control equipment

Prevailing Wage Schedule (Effective 10/31/2019)
 Heavy Highway Construction (cont'd)

II. HEAVY AND HIGHWAY CONSTRUCTION

A. JOB CLASSIFICATION AND WAGE RATES

	Basic Hourly Rate	Fringe Benefits
BOILERMAKER	46.89	33.73
CARPENTER	47.81	28.04
(as of 5/01/20)	47.81	29.99
(as of 5/01/21)	47.81	31.99
CEMENT MASON	36.85	32.56
(as of 5/01/20)	36.85	34.36
(as of 5/01/21)	36.85	36.16
ELECTRICIAN	59.79	38.95
IRONWORKERS		
Structural & Ornamental	49.30	34.41
Reinforcing (Rodsetter)	46.41	30.85
Rigger & Machinery Mover	44.15	28.72
LABORERS		
Group One	31.95	26.50
(as of 5/1/20)	31.95	28.15
(as of 5/1/21)	31.95	29.90
Group Two	32.15	26.50
(as of 5/1/20)	32.15	28.15
(as of 5/1/21)	32.15	29.90
Group Three	32.15	26.50
(as of 5/1/20)	32.15	28.15
(as of 5/1/21)	32.15	29.90
Group Four	26.75	26.50
(as of 5/1/20)	26.75	28.15
(as of 5/1/21)	26.75	29.90
Group Five	32.80	26.50
(as of 5/1/20)	32.80	28.15
(as of 5/1/21)	32.80	29.90
Group Six	32.85	26.50
(as of 5/1/20)	32.85	28.15
(as of 5/1/21)	32.85	29.90
Group Seven	32.70	26.50
(as of 5/1/20)	32.70	28.15

HEALTH CARE CENTER NO. 10
 INTERIOR IMPROVEMENTS AND ADDITIONS
 007343-10
 PREVAILING WAGE RATES

(as of 5/1/21)	32.70	29.90
Group Eight	32.45	26.50
(as of 5/1/20)	32.45	28.15
(as of 5/1/21)	32.45	29.90

Prevailing Wage Schedule (Effective 10/31/2019)
Heavy Highway Construction (cont'd)

Group Nine	32.30	26.50
(as of 5/1/20)	32.30	28.15
(as of 5/1/21)	32.30	29.90
Group Ten	32.45	26.50
(as of 5/1/20)	32.45	28.15
(as of 5/1/21)	32.45	29.90
Group Eleven	32.35	26.50
(as of 5/1/20)	32.35	28.15
(as of 5/1/21)	32.35	29.90
Group Twelve	34.05	26.50
(as of 5/1/20)	34.05	28.15
(as of 5/1/21)	34.05	29.90
Group Thirteen	36.08	26.50
(as of 5/1/20)	36.08	28.15
(as of 5/1/21)	36.08	29.90
Group Fourteen	32.20	26.50
(as of 5/1/20)	32.20	28.15
(as of 5/1/21)	32.20	29.90
LANDSCAPING LABORER		
Class I	24.22	23.50
Class II	24.22	23.50
LINE CONSTRUCTION		
Lineman	54.66	28.56
Winch Truck Operator	38.26	23.47
Line Truck Driver	35.53	22.62
Ground hand	32.80	21.78
Watch/Flag Person	23.37	18.85
MILLWRIGHT	45.30	33.29
PAINTERS		
Brush & Roller	39.04	28.99
Spray, Steel, & Swing	40.29	28.99
Bridges	55.52	28.39

Prevailing Wage Schedule (Effective 10/31/2019)
 Heavy Highway Construction (cont'd)

POWER EQUIPMENT OPERATOR

Group One	46.41	30.60
(as of 5/01/20)	46.41	32.60
(as of 5/01/21)	46.41	34.60
Group One A	49.41	31.49
(as of 5/01/20)	49.41	33.49
(as of 5/01/21)	49.41	35.49
Group Two	46.16	30.53
(as of 5/01/20)	46.16	32.53
(as of 5/01/21)	46.16	34.53
Group Two A	49.17	31.41
(as of 5/01/20)	49.17	33.41
(as of 5/01/21)	49.17	35.41
Group Three	42.08	29.72
(as of 5/01/20)	42.08	31.72
(as of 5/01/21)	42.08	33.72
Group Four	41.78	29.23
(as of 5/01/20)	41.78	31.23
(as of 5/01/21)	41.78	33.23
Group Five	40.06	28.72
(as of 5/01/20)	40.06	30.72
(as of 5/01/21)	40.06	32.72
Group Six	39.07	28.43
(as of 5/01/20)	39.07	30.43
(as of 5/01/21)	39.07	32.43
Group Seven A	56.30	35.11
(as of 5/01/20)	56.30	37.51
(as of 5/01/21)	56.30	39.91
Group Seven B	56.00	35.03
(as of 5/01/20)	56.00	37.43
(as of 5/01/21)	56.00	39.83

*****TOXIC/HAZARDOUS WASTE REMOVAL*****

Add 20 percent to basic hourly rate for all classifications

POWER EQUIPMENT OPERATOR DREDGER

Class A	38.18	14.28
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HEALTH CARE CENTER NO. 10
 INTERIOR IMPROVEMENTS AND ADDITIONS
 007343-12
 PREVAILING WAGE RATES

Class A1	46.93	29.76
Class B1	33.03	13.87
Class B2	31.09	13.71
Class C1	30.24	13.34
Class C2	29.26	13.27
Class D	24.30	12.57
PILED RIVERMAN	43.45	34.57
(Diver)	53.89	32.57
STEAM FITTER	56.37	37.79
STONE MASON	43.25	29.60

Prevailing Wage Schedule (Effective 10/31/2019)
Heavy Highway Construction (cont'd)

Surveying and Layout		
(Chief of Party)	54.98	28.04
(as of 5/01/20)	54.98	30.28
(as of 5/01/21)	54.98	32.58
(Instrument Person)	47.81	28.04
(as of 5/01/20)	47.81	30.28
(as of 5/01/21)	47.81	32.58
(Rodman)	38.25	21.34
(as of 5/01/20)	38.25	22.90
(as of 5/01/21)	38.25	24.50
TRUCK DRIVER		
Class I	32.06	19.185
Class II	32.16	19.185
Class III	32.41	19.185

B. Job Classification Definitions: Heavy and Highway Construction

1. Laborer Classifications:

Group One: Yard workers: (laborer, scale mixerman, burnerman, dustman, feeder)

Group Two: General laborer; Asphalt Shovelers; Sheeting, Shoring & Lagging – Laborer; Stone, Granite & Artificial Stone Setting Laborer; Hod Carriers; Scaffold Building; Relief Joint & Approach Slabs; Assembling & Placing Gabions; Pneumatic Tool Laborers; Concrete Forms & Stripping Laborers; Concrete Lumber Material Laborers; Steel & Steel Mesh (carrying & handling); Form Pinners; Mortar Mixers; Pouring & Placing Concrete; Grade Men.

Group Three: Vibrator Laborers; Finish Surface Asphalt Rackers; Jackhammer Operators; Paving Breaker Operator; Pipelayer & Caulker (all joints up to within 5 feet of the Building Foundation Line); Conduit & Duct Layers

Group Four: Flagperson

Group Five: Miners

Group Six: Welders and Burners.

Group Seven: Miner Bore Driver; Blasters; Drillers Pneumatic Shield Operator

Group Eight: Form Setters

Group Nine: Trackmen; Brackmen; Groutmen; Bottom Shaft Men; All other Laborers in Free Air Tunnels; Underpinning (When an underpinning excavation for a pier hole of five feet square or less and eight feet or more deep is dug, the rate shall apply only after a depth

of eight feet is reached, to the men working in the bottom)

Group Ten: Circular Caissons (Where an excavation for circular caissons are dug eight feet or more below the natural grade level adjacent to the starting point of the caisson hole, at ground level, for the men working in the bottom); Welders, Burners & Air Tuggers

Group Eleven: Powdermen; Multiple Wagon Drill Operator Laborer

Group Twelve: Caisson Laborer Foreman

Group Thirteen: Toxic/Hazardous waste Handler

Group Fourteen: Wagon Drill/Hydraulic Track Drill Operator Laborer

Landscape Laborers:

Class I: Landscape laborer

Class II: Farm tractor driver, hydroseeder, mulcher nozzle worker, backhoe operator, bulldozer crawler type loader, tree crane operator.

Prevailing Wage Schedule (Effective 10/31/2019)

Heavy Highway Construction (cont'd)

2. Power Equipment Operator Classifications - Heavy, & Highway

Group One:

Handling steel and stone in connection with erection Cranes doing hook work

Any machines handling machinery

Cable spinning machine

Helicopters

Concrete Pumps (building)

Machines similar to above including remote control equipment

Group One A:

Handling steel and stone in connection with erection.

Cranes doing hook work

Any machines handling machinery

Concrete Pumps (Building)

High Rail/Burro Crane

Rail Loader (Winch Boom Type)

All equipment in this group which previously received the hour in lieu of an oiler will receive Wage Group I (A). Equipment in this Wage Group that does not require an oiler.

Machines similar to above, including remote control equipment

Group Two:

All types of cranes

All types of backhoes

Draglines

Keystones

All types of shovels

Derricks

Pavers 21E and over

Trenching machines

Trench shovels

Gradalls

Front- end Loaders

Boat Captain

Hoist with Two Towers

Building Hoists-double drum (unless used as a single drum)

Pippin type backhoes

Tandem scrapers

Tower type crane operation erecting dismantling jumping or jacking
Drills self-contained (Drillmaster type)
Fork lift (20ft. and over)
Motor Patrols (fine grade)
Batch Plant with Mixer
Caryalls, Scrapers, Tournapulls
Roller (High Grade Finishing)
Spreaders (Asphalt)
Bulldozers and Tractors
Mechanic-Welder
Conveyor Loaders (Euclid-Type Wheel)
Concrete Pumps (Heavy Highway)
Milling Machine
Prevailing Wage Schedule (Effective 10/31/2019)
Heavy Highway Construction (cont'd)

Bobcat
Side Boom
Directional Boring Machines
Vermeer Saw Type Machine (other than hand held)
Tractor Mounted Hydro Axe
Chipper with boom
All Autograde and concrete finishing machines
Bundle Pullers/Extractors (Tubular)

Machines similar to the above including remote control equipment

Group Two A:

Crawler backhoes and Crawler gradalls over one (1) cubic yard factory rating
Hydraulic backhoes over one (1) cubic yard factory rating
Single person operation truck cranes 15 ton and over factory rating
Cherry picker type machinery and equipment 15 ton and over factory rating, etc.
Cranes doing hook work will be paid Wage Group I (A).
All equipment in this Group which previously received the hour in lieu of an oiler will receive Wage Group II (A) including concrete pumps (Heavy/Highway).

Machines similar to the above including remote control equipment

Group Three:

Asphalt Plant Engineers
Conveyors (except building conveyors)
Well Drillers
Forklift Trucks of all types
Ditch Witch (small trenchers)
Motor Patrols
Fine Grade machines
Rollers
Concrete Breaking Machines (Guillotine Only)
Stump Grinder
High or Low Pressure Boilers
Building Hoist (single drum)
Elevator Operator (New Construction)

Machines similar to above including remote control equipment

Group Four:

Seamen Pulverizing Mixer
Form Line Graders
Farm Tractors
Road Finishing Machines
Concrete Spreaders (Heavy Highway)
Power Broom (self-contained)
Seed Spreader
Grease Truck

Machines similar to the above including remote control equipment

Group Five:

Compressors
Pumps
Well pint pumps
Conveyors (Building)

Prevailing Wage Schedule (Effective 10/31/2019)
Heavy Highway Construction (cont'd)

Welding Machines
Heaters
Tireman, Power Equipment
Maintenance Engineers (Power Boats)
Miscellaneous Equipment Operator
Elevator Operator (Renovations)
House Car

Machines similar to above including remote control equipment

Group Six:

Fireman
Oilers and Deck Hands (Personnel Boats)
Grease Truck Helpers

Group Seven A:

Handling steel and stone in connection with erection
Cranes doing hook work
Any machines handling machinery
Cable spinning machinery
Helicopters
Concrete pumps (Building)
High Rail/Burro Crane
Rail Loader (Winch Boom Type)

Machines similar to above, including remote control equipment

Group Seven B:

All types of cranes
All types of backhoes
Cableways
Conveyor Loader (Euclid-Type Wheel)
Drag Lines
Keystones
All types of shovels
Derricks
Pavers 21E and over
Trench shovels

Trenching machines
Gradalls
Front-end Loaders
Boat Captain
Hoist with two towers
Concrete Pumps (Heavy, Highway)
Building Hoists-double drum (unless used as a single drum)
Milling Machine
Mucking Machines in Tunnel
Pippin type backhoes
Bobcat
Tandem scrapers
Side Boom
Tower type crane operation, erecting, dismantling,
Jumping or jacking
Prevailing Wage Schedule (Effective 10/31/2019)
Heavy Highway Construction (cont'd)

Directional Boring Machines
Vermeer Saw Type Machine (other than hand held)
Drills self-contained (Drillmaster type)
Fork Lift (20 ft & over)
Tractor Mounted Hydro Axe
Motor Patrols (Fine Grade)
Chipper with boom
Batch Plant with Mixer
All autograde and concrete finishing machines
Carralls, Scapers & Tournapulls
Rollers (High Grade Finishing)
Bundle Pullers/Extractors (Tubular)
Spreaders (Asphalt)
Bulldozers and Tractors
Mechanic – Welders
Production Switch Tamper
Ballast Regulators
Tie Replacer
Rail/Road Loader
Power Jack liner
Machines similar to above, including remote control equipment
*Surcharge

Power Equipment Operator Dredger Classifications

Class A: Lead Dredgeman, Operator, Leverman, Licensed Tug Operator over 1000HP.

Class A1: Dozer Operator, Front-end Loader.

Class B1: Derrick Operator, Spider/Spill Barge Operator, Engineer, Electrician, Chief welder Chief Mate, Fill Placer, Operator 2, Maintenance Engineer, Licensed Boat Operator.

Class B2: Certified Welder.

Class C1: Mate, Drag Barge Operator, Steward, Assistant Fill Placer, Welder.

Class C2: Boat Operator.

Class D: Shoreman, Deckhand, Rodman, Scowman, Cook, Messman, Porter/Janitor, Oiler.

3. Truck Driver Classifications:

Class I: Helper, stake body truck operator (single axle, dumpster)

Class II: Dump truck operator, tandem truck operator, batch truck operator, semi-trailer truck operator, agitator-mixer truck operator, dumpcrete type vehicle operator, asphalt distributor, farm tractor operator (when used to transport materials), stake body truck (tandem) operator.

Class III: Euclid type, off highway equipment back truck operator, belly dump truck operator, double-hitched equipment trailer operator, straddle carrier (Ross) operator; lowbed trailer truck operator.

Prevailing Wage Schedule (Effective 10/31/2019)
Heavy Highway Construction (cont'd)

NOTE:

1. Contractors are advised to contact the Philadelphia Labor Standards Unit with any questions regarding job classification, prevailing wage rates, and fringe benefits.
2. Prior to employing apprentices on a public works project, the contractor is required to provide written evidence of employee's registration with a statewide training program recognized by the U.S. Bureau of Apprenticeship and Training (BAT). Contractors shall forward proper documentation for each bona fide apprentice to:

**Philadelphia Labor Standards Unit
Municipal Services Building
1401 John F. Kennedy Boulevard – 1st Floor, Room 170C
Philadelphia, PA 19102-1670
Telephone Number: (215) 686-2132
Fax Number: (215) 686-2116**



SECTION 011200

SUMMARY OF THE WORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section summarizes construction operations required by the Contract Documents, defines aspects of Prime Contractor's relationship with City and lists special City requirements.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 PROJECT DESCRIPTION

- A. The Work covers the construction of two building additions, renovation of staff areas and selected medical areas and site improvements for Health Care Center 10 located at 2230 Cottman Avenue, Philadelphia, PA 19149. This is the busiest Health Care Center in the City, and respect for the presence of public and staff is paramount. The Center is open from 7:00 AM to 4:00 PM and most Saturdays.
- B. Work of the East and West Additions and the Staff Areas are documented by Bolender Architects and their MEP and Structural Engineers.
- C. Work in Exam Rooms 107-120, 128-132; Walk-In and Triage Exam Rooms; Pharmacy Improvements, Restroom Improvements, and Site Improvements, are documented by the Department of Public Property (DPP) and are not under the purview of Bolender Architects and their MEP and Structural Engineers.

1.4 PHASING AND SHIFT WORK

- A. Construct work in phases to accommodate City's use of premises during construction period.
 - 1. Provide temporary interior separators (wood stud and GWB or approved equal) between areas of work and areas to remain in operation by the City during construction.
 - 2. Seal open areas of interior work with plastic including sealing air vents and returns and use HEPA air cleaners in use during performance of work.
- B. Coordinate the construction schedule and operations with the DPP Project Coordinator.
- C. Construct the work in phases to provide for public safety and convenience.
- D. Use of facility by the public cannot be cut off during any phase of construction.
- E. The Health Center must remain open during normal working hours. All work involving renovations to medical areas, exterior wall and site demolition, nail guns and pneumatic staple guns, equipment causing vibrations, or any other activities involving excessive noise or smell (including VCT installation) in or around the Health Center shall be performed between the hours of 4:00 PM and 11:30 PM. Saturday and Sunday work may be allowed but is not guaranteed except for renovations to toilet rooms, which are required to be done on weekends.
- F. Renovations to Office 166 and Open Office 172 must be completed before demolition of the adjacent spaces to allow useable space for the Health Center during construction.

PROJECT No. 14-18-4745-01

Health Care Center # 10 - Interior and Exterior Improvements

011200-1

SUMMARY OF THE WORK

- G. Renovations to Exam Rooms will be scheduled by DPP for work to be performed one group of adjacent rooms at a time (four groups of exam rooms). Timing of this work will be set by DPP, coordinated with Contractor's schedule.
- H. Renovations to Room 200, timing of this work will be set by DPP, coordinated with Contractor's schedule.
- I. Renovations to the Pharmacy will be scheduled by DPP to coincide with the availability of State Inspectors. The Pharmacy will be closed for a maximum of two weeks, to include renovations and the state inspection. Timing of this work will be set by DPP, coordinated with Contractor's schedule.
- J. Renovations to the Toilet Rooms will be scheduled by DPP for work to be performed on a weekend. Four (4) restrooms for a total of 4 weekends. Timing of this work will be set by DPP, coordinated with Contractor's schedule.
- K. Bidders must include any premium for 2nd shift or overtime work in their bid and specify the percentage of the contract total that will be performed as evening or night shift work.
- L. Bidders shall include sufficient time for DPP to provide protection of furniture/equipment at the start of each day's work in the Health Center.
- M. Bidders shall include sufficient time for clean-up of each space at the end of each day's work in the Health Center. Each space shall be left in the same condition it was before the work took place. Remove all debris and clean all hard surfaces and carpeted areas free of dust.

1.5 CONTRACTOR'S USE OF PREMISES

- A. Contractor's use of premises is outlined in Projected Phasing Plan, which shows how medical area renovations can be scheduled, and how many exam rooms are allowed be taken out of service at one time, and what areas will require two week notification for staff to be relocated. Dates for work outside the building perimeter are at the discretion of the Contractor. Schedule for Pharmacy closure will be critical and may adjust the schedule for work in other medical areas.
- B. Prime Contractors shall limit use of the premises for Work and for storage to allow:
 - 1. Owner occupancy
 - 2. Public use
- C. Coordinate use of premises with DPP Project Coordinator per Project Schedule, unless, agreed otherwise upon change request and approval.
- D. Protect products stored on-site
- E. Store products to avoid interference with operations of City or other Prime Contractors
- F. Secure and pay for additional storage and work areas if required for Contractor's work. Contractor will have full use of east and west yards, and will be allowed dumpster space at the west side of the parking lot equal to (3) parking spaces.
- G. Do not overload structure with stored materials.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -



SECTION 012100 ALLOWANCES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's administrative and procedural requirements governing handling and processing allowances

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Each section of the specifications including an allowance.

1.3 COORDINATION

- A. Designate required selection and delivery dates for products under each allowance in the Contractor's Construction Schedule.
- B. Designate each allowance with extensions based on estimated quantities for unit price allowances on Contractor's Schedule of Values.

1.4 DEFINITIONS

- A. Refer to Section 007200.

1.5 ALLOWANCES

- A. Include in Total Base Bid Amount, an amount equal to Two Percent (2%) of the base bid amount for payment of permit fees. This is a direct cost; no mark-ups will be permitted.
- B. Include in the Total Base Bid Amount, the amount of \$50,000.00 (fifty-thousand) for miscellaneous modifications to existing spaces.
- C. Amount of each allowance (excluding 1.5.A&B above) shall include:
 - 1. Net cost of product.
 - 2. Delivery to site.
 - 3. Applicable taxes.
 - 4. Preparing submittals.
- D. In addition to amounts of allowances (excluding 1.5.A above), include in the base bid amount, the Contractor's cost for:
 - 1. Assisting in selection and obtaining proposals from suppliers and subcontractors.
 - 2. Processing submittals.
 - 3. Handling at site, including unloading, uncrating and storage.
 - 4. Protection from elements and from damage.
 - 5. Labor, installation and finishing.
 - 6. Other expenses required to complete installation.
 - 7. Overhead and profit.

1.6 SELECTION OF PRODUCTS

- A. Design Professional shall issue by Change Order a full specification for the final selected product.
- B. Contractor's Duties
 - 1. Notify Design Professional of deadlines for specification of final products, allowing for Contractor's required submissions as required to meet Date of Completion.
 - 2. Provide cost proposals for products being considered when requested by Design Professional.
 - 3. Notify Design Professional of any effect anticipated by selection of product or supplier under consideration as it relates to:
 - a. Construction Schedule.
 - b. Contract Sum.
 - c. On notification of selection, enter into purchase agreement with designated supplier.

1.7 INSTALLATION

- A. Comply with requirements of applicable specification section, including warranties/guarantees.

1.8 ADJUSTMENT OF COSTS

- A. Should actual purchase cost be more or less than specified amount of allowance, Contract Sum shall be adjusted by Change Order equal to amount of difference. A percentage to cover Contractor's overhead and profit, as stated in Standard Contract Requirements, will be applied to difference in cost.
- B. For products specified under unit cost allowance unit cost applies to quantity required to complete the Work as determined by the Contractor.
 - 1. Submit invoices or other data to substantiate quantity actually used.
- C. Submit request for other costs, claimed for additional work caused by increase over amount of allowance, prior to required submission for product.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

-END-



SECTION 012500
SUBSTITUTION PROCEDURES

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's administrative and procedural requirements for handling requests for substitutions made after award of the Contract. Procedural requirements governing the Contractor's selection of products and product options are included under Section "Materials and Equipment".

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions - Requests for changes in products, materials, equipment, and construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions". The following shall not be considered substitutions:
 - 1. Substitutions requested by Bidders during the bidding period, and accepted in Addenda prior to award of Contract.
 - 2. Revisions to Contract Documents requested by the City or Design Professional.
 - 3. Specified options of products and construction methods included in Contract Documents.
 - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.
- C. "Or equal", "or equivalent", "approved equal", "approved equivalent", "equivalent substitution" and all other similar terms shall be interpreted as "substitution" as defined above.

1.4 SUBMITTALS

- A. Submit three (3) copies of each request for substitution. Submit requests with the form attached at the end of this Section and in accordance with procedures required for Change Order proposals. Attach all other data and certification.
- B. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate.
- C. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
- D. Samples, where applicable or requested.

- E. A detailed comparison of salient features and qualities of the proposed substitution with those of the Work specified. Salient features and qualities may include elements such as size, weight, durability, performance and visual effect as determined by the Design Professional. Submit documentation of salient features and qualities from independent testing agencies performing industry recognized tests. The manufacturer's claims of performance may or may not be used in evaluation of substitutions at the discretion of the Design Professional.
- F. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the PRA and separate Contractors, that will become necessary to accommodate the proposed substitution.
- G. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
- H. Cost information, including a proposal of the net change, if any in the Contract Sum. The Contractor shall certify that the cost data presented is complete and includes all related costs under this Contract, but excludes the Design Professional's redesign costs.
- I. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
- J. Certification that the Contractor will reimburse the PRA for all costs for additional services by the Design Professional and/or the Department of Public Property relating to any substitution that necessitates a design change and related documentation.
- K. Design Professional's Action - The Design Professional will notify the Contractor of acceptance or rejection of the proposed substitution. The Design Professional will be the sole judge of the acceptability of the proposed substitution. Acceptance will be in the form of a Change Order. The Change Order will include a deduction from the Contract Sum for additional costs incurred by the PRA because of the substitution including, but not limited to, Design Professional's fees.

PART 2—PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions - The Contractor's substitution request will be received and considered by the Design Professional when one or more of the following conditions are satisfied, as determined by the Design Professional; otherwise requests will be returned without action except to record noncompliance with these requirements.
 - 1. Extensive revisions to Contract Documents are not required.
 - 2. Proposed changes are in keeping with the general intent of Contract Documents.
 - 3. The request is timely, fully documented and properly submitted.

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4. The request is directly related to an “or approved substitution” clause or similar language in the Contract Documents.
 5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 7. A substantial advantage is offered the PRA, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the PRA may be required to bear. Additional responsibilities for the PRA may include additional compensation to the Design Professional for redesign and evaluation services, increased cost of other construction by the PRA or separate Contractors, and similar considerations.
- B. The specified product or construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
 - C. The specified product or construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
 - D. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.
 - E. Where a proposed substitution involves more than one Prime Contractor, each Contractor shall cooperate with the other Contractors involved to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.
 - F. The Contractor’s submittal and Design Professional acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3—EXECUTION Not Applicable

Attachment - Substitution Request Form (4 pages)

END OF SECTION

PRA SUBSTITUTION REQUEST FORM

INSTRUCTIONS:

- A. This request must be submitted and signed by the Prime Contractor.
- B. A request for each substitution must be exactly in this form, including all items. (One (1) item of substitution per form).
- C. Attach complete information on changes to Drawings and Specifications that proposed substitution will require for its proper installation.
- D. Submit with request, all necessary samples and substantiating data to prove quality and performance is equal to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance

CONTRACT AWARD DATE: _____ DATE OF REQUEST: _____

CONTRACTOR: _____

PROJECT: _____

We hereby submit for your consideration the following substitution in lieu of the specified item for the above project:

SPEC. SECTION NO.: _____ PARAGRAPH: _____ SPECIFIED ITEM: _____

PROPOSED
SUBSTITUTION: _____

REASON
FOR
REQUEST: _____

ITEMIZED COMPARISON OF SPECIFIED ITEM WITH THE PROPOSED SUBSTITUTION:
PERFORMANCE: _____

APPEARANCE:_____

REFERENCED
STANDARDS:_____

DEDUCT CHANGE ORDER OFFERED FOR PROPOSED SUBSTITUTION:_____

MANUFACTURER'S WARRANTIES OF THE PROPOSED AND SPECIFIED ITEMS:

LENGTH OF WARRANTY: AS SPECIFIED[]. PROPOSED[]

MATERIALS COVERED:AS SPECIFIED []. PROPOSED[]

LABOR COVERED:AS SPECIFIED []. PROPOSED[]

OTHER TERMS: AS SPECIFIED:_____

PROPOSED SUBSTITUTION:_____

DESIGNATION OF MAINTENANCE SERVICES AND SOURCES:_____

DOES SUBSTITUTION AFFECT DIMENSIONS OR CLEARANCES SHOWN ON THE
DRAWINGS? YES [] NO [].

IF YES, CLEARLY INDICATE
CHANGES:_____

WILL THE UNDERSIGNED PAY FOR CHANGES TO THE BUILDING DESIGN,
INCLUDING ENGINEERING AND DETAILING COSTS CAUSED BY THE REQUESTED
SUBSTITUTION? YES [] NO [].

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IF NO, FULLY EXPLAIN: _____

WHAT EFFECT DOES SUBSTITUTION HAVE ON OTHER CONTRACTS OR TRADES?__

WHAT EFFECT DOES SUBSTITUTION HAVE ON CONSTRUCTION SCHEDULE?_____

CONTRACTORS CERTIFICATION OF EQUAL PERFORMANCE

The undersigned certifies that:

He/she has investigated the proposed substitution and has determined that it is equal to or better than the product specified.

He/she will guarantee the substitution in the same manner as the product specified.

He/she will coordinate and make other changes as required in the Work as a result of the substitution.

He/she waives all claims for additional costs as a result of the substitution, with the exception of those identified above under "cost data".

He/she will reimburse the PRA for all costs for design change resulting from the substitution.

Submitted by:

Signature _____

Name: _____ Title: _____

Firm: _____ Date: _____

Street: _____

City _____ State _____ Zip Code _____

Telephone: _____

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Signature shall be by person having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in rejection without further review by Design Professional.

Design Professional's Action

Accepted []

Accepted as noted []

Not accepted []

Received too late []

Signature: _____

END OF SECTION



SECTION 012600

CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 CHANGE ORDER PROCEDURE

- A. If a change in the design of any portion of the work or the requirements of the Project Manual is deemed necessary by the Department of Public Property, the Department may order an alteration to, or a change in, the work covered by the Contract Documents, and the contractor shall comply with such orders. If such changes increase the cost of the work to the Contractor, the PRA will allow additional compensation. If such changes diminish the cost of the work to the Contractor the PRA may deduct the amount of the diminution. No consequential loss or profit due to reduction in the scope of work will be allowed the Contractor, but the Contractor may be entitled to an extension of time in these instances. No changes shall be made except upon a PRA standard Change Order Form, signed and executed by the Contractor and the Department of Public Property authorizing the change and fixing the method of compensation or deduction. This Section specifies administrative and procedural requirements for handling and processing Change Orders.
- B. The execution of a change order (increase or decrease) will require a proposal from the Contractor on company letterhead. Such proposal will include a complete description of the change and schedule impact and a complete cost breakdown including such items as Labor, Materials, Equipment, Crew Composition, Sub-Contractor costs, and associated Insurance and Bonding costs (if applicable). The contractor is entitled to percentage mark-ups on some of these items as stated in the Standard Contract Requirements. The proposal is to be submitted to the identified Department of Public Property Project Coordinator. Upon review and approval by the Department of Public Property Project Team, a signed Department of Public Property standard Change Order Form will be forwarded to the Contractor for final execution.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements and other Division 1 sections including Sections 48 through 52 of the Standard Contract Requirements (007200).

1.3 CONTRACTOR'S RESPONSIBILITY TO INFORM

- A. Communication, either verbal or written, between the PRA or Design Professional and the Contractor, Subcontractors, or other parties involved, during the normal course of administration of the Contract, does not in any way constitute acceptance of a Change Order or direction to modify the Contract unless said communication is in the form of a written Change Order or Construction Change Directive as specified herein.
- B. Communication from the PRA or Design Professional including, but not limited to the following, does not constitute approval of a Change Order:
 - 1. Submittal review including submittals returned with notations and corrections;
 - 2. Site observation, conversation and reports;
 - 3. Participation in pre-construction, pre-installation, progress or other meetings;

4. Clarification sketches or drawings.
 - C. It is the responsibility of the Contractor to inform the PRA that any communication has, in the Contractor's opinion, caused reason to modify the Contract. The Contractor shall not undertake work which, in his opinion, requires a Change Order without completing procedures outlined herein.
 - D. Work done without completing Change Order procedures is entirely at the Contractor's own risk, even if the Contractor believes that communications from the PRA or Design Professional contain instructions to do work outside of the Contract scope.
 - E. The PRA and Design Professional will not willfully instruct work to be done that differs from the contract except through the Change Order procedures contained herein.
- 1.4 MINOR CHANGES IN THE WORK
- A. Supplemental instructions, not involving an adjustment to the Contract Sum or Contract Time, may be issued in writing by the PRA.
- 1.5 CHANGE ORDER PROPOSALS
- A. PRA-Initiated Change Order Proposal - Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the PRA, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
 1. Change Order Proposal requests issued by the PRA are for information only. Do not consider them as instruction either to stop work in progress, accelerate the work or to execute the proposed change.
 2. Unless otherwise indicated in the Change Order Proposal request, within 20 days of receipt of the Change Order Proposal request, submit to the PRA for review, an estimate of cost necessary to execute the proposed change.
 - a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Separate labor and material charges. Where requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time or any special efforts of the Contractor that will be employed to reduce the delay.
 - d. Indicate that the Change Order Proposal is in response to a PRA request and submit it to the PRA as stated in 1.1 (B) of this section.
 - B. Contractor-Initiated Change Order Proposal – When Contractor claims latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a Change Order Proposal.
 1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Comply with requirements in Section 01630 "Substitution Procedures" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
5. Submit the proposal to the PRA as stated in 1.1 (B) of this section.

1.6 ALLOWANCES

- A. Refer to Section 01210, Allowances.

1.7 CONSTRUCTION CHANGE DIRECTIVE (Force Account)

- A. When the PRA and Contractor are not in total agreement on the terms of a Change Order Proposal, the PRA may issue a Construction Change Directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
- B. The Construction Change Directive will contain a complete description of the change in the Work.
- C. Documentation - Maintain detailed records on a time and material basis of work required by the Construction Change Directive. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
 1. Contractor's documentation will not, by itself, establish the final cost.
 2. The PRA reserves the right to determine the value of the change in Work per the requirements of this Section.


1.8 DETERMINATION OF COST

- A. PRA reserves the right to use established estimating methods (including but not limited to industry standards and unit prices listed in this manual) to determine a fair and reasonable cost for changes in the Work.

PART 2 PRODUCTS Not used.

PART 3 EXECUTION

- 2.1 Sample Change Order Form, contact Project Coordinator for actual document.

CHANGE ORDER		CITY OF PHILADELPHIA Department of Public Property ONE PARKWAY BLDG. 1515 ARCH STREET PHILADELPHIA, PA 19102			
Change Order No.:		Date:			
Project No.:		Contractor Name:			
Contract No.:		Contractor Address:			
Bid Number:					
Project Title:					
Facility Name:		Contact Person:			
Facility Address:		Phone No.:		Fax:	
JUSTIFICATION: <small>(*unmerge* call if different format is desired)(Format-Cells-Alignment)</small>					
I) Description of Specified Work (What is Required By the Contract?) - <i>Do not simply write "See Attached"</i>					
II) Explanation of Why Change is Necessary (What is the Problem?) Include CO Code below - <i>Do not simply write "See Attached"</i>					
III) Description of Changes and Cost (What is the Solution?) - <i>Do not simply write "See Attached"</i>					
SAMPLE					
CO Category Codes: Unforeseen Condition (UF), Design Error/Omission (EO), User Scope Change (UC), DPP Scope Change (DPP), Time Extension Only (TO), Other (explain)					
CO Type:	<input type="checkbox"/> Negotiated	<input type="checkbox"/> Force Account	Cost Impact (CO\$):	Time Impact (days)	
This Change Order shall cover all of Contractor's costs associated with the change reflected by this change order, including all costs incurred by the Contractor for time, material, labor, and/or overhead. The contract time extension granted by the City for this Change Order shall be the sole time extension granted for this change and for which contractor is entitled, and no other time extension shall be granted by the City. Contractor agrees that this Change Order shall operate as a complete waiver and release of all claims related to the change, whether such is considered individually or cumulatively, including, but not limited to, any claim by Contractor for extended home office overhead, extended field office overhead, time-impact costs, schedule delay costs, acceleration costs, compression, loss of productivity costs, extra work, additional work, and/or interference costs. This Change Order shall supersede the proposal of the contractor to the extent that it conflicts with the proposal.					
REVIEW BY		Additional Funding Required		Cost Recap:	
5. Contractor	Date	<input type="checkbox"/> Yes <input type="checkbox"/> No			
1. Construction Representative	Date	Source:	(a) Original Contract Limit	\$125,000.00	
		Amount:	(b) Prior Amendment(s)		
		Source:	(c) Bid Amount	\$100,000.00	
		Amount:	(d) Contingency (a+b)-c	\$25,000.00	
APPROVALS		Source:	(e) CO's Approved to date	\$4,000.00	
2. Project Coord./Manager	Date	Amount:	(f) Contingency Available (d-e)	\$21,000.00	
		Source:	(g) Cost of this CO	\$5,000.00	
		Amount:	(h) Total COs After this CO (e+g)	\$9,000.00	
3. Project Director	Date	Add'l Funding Approval Budget Office	(i) Contin. Bal. After CO (f-g)	\$16,000.00	
			(j) Contin. Orig % (d/c) =max 25%	25%	
4. Deputy Commissioner	Date		(k) Contin. % After CO (e+g)/c	9%	
			Change Order Category Amount		
		Date	Release Contingency		
			Amend Contract		

cc: Original to File (4,10), Project Director, Project Coord./Manager, Construction Representative, Budget Coord., Contractor, Contracts Management (with Invoice)

-END-



SECTION 012900
PAYMENT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies administrative and procedural requirements governing each Prime Contractor's submission of invoices for Payment. These may also be referred to as "Current Estimates" in the Standard Contract Requirements (00700).
- B. Coordinate the Contractor's Construction Schedule, List of Subcontracts, and Submittal Schedule with the Standard Cost Breakdown.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements and other Division 1 sections including Sections 53 through 57 of the Standard Contract Requirements (007200).

1.3 GENERAL REQUIREMENTS

- A. Each invoice for payment shall be consistent with previous applications and payments.
- B. The initial submission of the Standard Cost Breakdown at time of Substantial Completion, and the final Standard Cost Breakdown involve additional requirements.
- C. Withholding Payment - Any payment may be withheld in accordance with the Contract Documents
 - 1. Any payment may be withheld if the procedural requirements including submittal of current administrative items listed including Certificates of Insurance are incomplete or outdated.
 - 2. Portions of payment requested for Work installed without approved submittals may be withheld.
- D. Use Department of Public Property, "Standard Cost Breakdown".
- E. Standard Cost Breakdown Preparation - Complete every entry on the Standard Cost Breakdown:
 - 1. Contractor (name and address)
 - 2. Contract number (from Notice to Proceed);
 - 3. Requisition No. (sequential number);
 - 4. Date Prepared;
 - 5. Project (title of project);
 - 6. Project No. (project number).
 - 7. STANDARD COST BREAKDOWN

- a. No. (sequentially numbering);
 - b. Item (phases of scope of work);
 - c. Unit (each, sq. ft., etc.);
 - d. Material;
 - e. Labor;
 - f. Unit Cost;
 - g. Total (total of Material and Labor).
8. PAYMENT APPLICATION
- a. Previous Billing (as billed previous application);
 - b. Percent Complete (completed to date);
 - c. Total Completed (Total column under COST BREAKDOWN multiplied by Percent Complete column under PAYMENT APPLICATION.)

Incomplete Standard Cost Breakdowns will be returned without action.

- F. Entries shall match data on the Contractor's Construction Schedule. Use updated schedules if revisions have been made.
- G. Include amounts of Change Orders issued prior to the last day of the construction period covered by the Standard Cost Breakdown.
- H. Submit original plus 2 copies of each Standard Cost Breakdown to the Project Robert LaBrum, Director, Design and Construction, Philadelphia Redevelopment Authority, 1234 Market Street, 16th Floor, Philadelphia, PA 19107. Robert.labrum@pra.phila.gov

1.4 INITIAL STANDARD COST BREAKDOWN

- A. Actions and submittals that shall precede or coincide with submittal of the first Standard Cost Breakdown include the following:
 - 1. List of subcontractors.
 - 2. List of principal suppliers and fabricators.
 - 3. Schedule of Values.
 - 4. Contractor's Construction Schedule (preliminary if not final).
 - 5. Schedule of unit prices.
 - 6. Submittal Schedule (preliminary if not final).
 - 7. List of Contractor's staff assignments.
 - 8. List of Contractor's principal consultants.
 - 9. Copies of building permits.
 - 10. Copies of authorizations and licenses from governing authorities for performance of the Work.
 - 11. Report of pre-construction meeting.
 - 12. Certificates of insurance.
 - 13. Performance and payment bonds.

14. Complete Submittals for each product or system included in the Application.
15. Initial settlement survey and damage report.
16. Reference Point Survey.
17. Current Daily and Monthly Reports.
18. Initial Construction Photographs and/or videos.

1.5 STANDARD COST BREAKDOWN AT SUBSTANTIAL COMPLETION

- A. This Standard Cost Breakdown shall reflect any Certificates of Partial Substantial Completion issued previously for City occupancy of designated portions of the Work.
- B. Actions and submittals which shall proceed or coincide with this Standard Cost Breakdown include:
 1. Occupancy permits and similar approvals.
 2. Warranties (guarantees) and maintenance agreements.
 3. Test/adjust/balance records.
 4. Maintenance instructions.
 5. Utility meter readings.
 6. Start-up performance reports.
 7. Certified improvement survey.
 8. Change-over information related to City's occupancy, use, operation and maintenance.
 9. Final cleaning.
 10. Final progress photographs.
 11. List of incomplete Work (punchlist), recognized as exceptions to Certificate of Substantial Completion.
 12. Record Documents.

1.6 FINAL STANDARD COST BREAKDOWN

- A. Actions and submittals which shall precede or coincide with submittal of the final Standard Cost Breakdown include the following:
 1. Project Closeout Form fully executed (signed).
 2. Completion of items specified for completion after Substantial Completion (punchlist).
 3. Assurance that unsettled claims will be settled.
 4. Assurance that Work not complete and accepted will be completed without undue delay.
 5. Transmittal of required Project construction records to PRA.
 6. Proof that taxes, fees and similar obligations have been paid.
 7. Removal of temporary facilities and services.

8. Removal of surplus materials, rubbish and similar elements.
9. Change of door locks to City's access.

- END -



SECTION 012973
SCHEDULE OF VALUES (CURRENT ESTIMATE)

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes administrative requirements for each Prime Contractor's Schedule of Values, referred to as "Current Estimate" in the Standard Contract requirements.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 COORDINATION

- A. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
1. Contractor's Construction Schedule.
 2. Standard Cost Breakdown
 3. List of subcontractors.
 4. Schedule of allowances.
 5. Schedule of alternates.
 6. Schedule of submittals.
- B. Submit the Schedule of Values to the PRA no later than ten (10) days after receipt of the Notice to Proceed. Submit six (6) copies.

1.4 FORMAT AND CONTENT

- A. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
1. Generic name.
 2. Related Specification Section.
 3. Name of subcontractor.
 4. Name of manufacturer or fabricator.
 5. Name of supplier.
 6. Change Orders (numbers) that have affected value.
 7. Dollar value.
 8. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.
 9. Margins of Cost - Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Standard Cost Breakdown. Each item in the Schedule of Values and Standard Cost Breakdown shall be complete including its total cost and proportionate share of general overhead and profit margin unless otherwise indicated.

10. At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.
11. Itemize separate line item cost for the following items under Division 1:
 - a. Field Engineering.
 - b. Construction Photographs.
 - c. Mock-up.
12. Itemize separate line item cost for each of the construction cost items under Divisions 2 through 16 per individual specification sections.
13. Itemize separate line item cost for each service contract.
14. Breakdown costs into:
 - a. Delivered cost of material, with taxes paid, with overhead and profit.
 - b. Installation cost, with overhead and profit.
 - c. If requested, break down high value line items to list major materials or operations.
 - d. Round off figures to nearest ten dollars.
 - e. Make sum total costs of all items listed in Schedule equal to Contract Limit.

1.5 UPDATING

- A. After review by the PRA, revise and resubmit schedules as required.
- B. Update and resubmit the Schedule of Values when change orders or construction change directions result in a change in the Contract Limit.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 013113
PROJECT COORDINATION

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's responsibilities to coordinate the work and related administrative procedures.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBMITTALS

- A. Submit the following prior to or coincidental with the initial application for payment.
 - 1. List of contractor's staff assigned to the project and responsibilities including personnel on and off-site. Include mailing address, delivery address, phone, fax, mobile phone, etc. For at least three (3) staff, list phones where personnel can be reached during non-work hours for emergencies.
 - 2. List of contractor's consultants and sub-contractors with similar requirements as above.
 - 3. List of principal suppliers and fabricators with similar requirements as above. No emergency phone number required.

1.4 OBSERVATION OF WORK BY OTHERS

- A. Observation of the Work by the PRA, Design Professional, Inspection and Testing Agencies or any other party shall not be interpreted as relieving the Contractor from responsibility for coordination of all Work, superintendence of the Work, and scheduling and direction of the Work or any other requirement of the Contract.

1.5 GENERAL CONTRACTOR'S RESPONSIBILITIES

- A. Coordinate the Work and Schedules of each separate Prime Contractor.
- B. Coordinate construction activities included under each Prime Contractor to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Contracts that are dependent upon each other for proper installation, connection, and operation.
- C. Where installation of one part of the Work is dependent on installation of other components by other Prime Contractors, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
- D. Where availability of space is limited, coordinate installation by each Prime Contractor of different components to assure maximum accessibility for required maintenance, service and repair.
- E. Make adequate provisions to accommodate items scheduled for later installation.
- F. Where necessary, prepare memoranda for distribution to each Prime Contractor outlining special procedures required for coordination. Include such items as

required notices, reports, and attendance at meetings. Copy memoranda to PRA and Design Professional.

- G. Coordinate compatibility of products furnished by each Prime Contractor. Refer to Section Materials and Equipment, Division 1.
 - H. Administrative Procedures - Coordinate scheduling and timing of each Prime Contractor's required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractors Construction Schedules and Schedules of submittals .
 - 2. Installation and removal of temporary facilities.
 - 3. Delivery and processing of submittals.
 - 4. Progress meetings.
 - 5. Project Closeout activities.
- 1.6 EACH PRIME CONTRACTOR'S RESPONSIBILITIES (including the General Contractor)
- A. Cooperate with the General Contractor's coordination efforts for orderly progress of the Work without delay or covering work which needs to be accessible to other Primes.
 - B. Coordinate the Work of associated sub-contractors.
 - C. Establish a Contractor's Construction Schedule and coordinate with General Contractor.
 - D. Maintain on the job-site at all times during the performance of the Work, a competent, English speaking superintendent.
 - E. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
 - F. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - G. Make adequate provisions to accommodate items scheduled for later installation.
 - H. When necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings. Copy memoranda to PRA and Design Professional.
 - I. Coordinate compatibility of products. Refer to Products and Materials, Division
 - J. Administrative Procedures - Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project Closeout activities.

1.7 LACK OF COOPERATION BETWEEN CONTRACTORS

- A. Delays attributable to lack of cooperation between the separate Prime Contractors and their sub-contractors shall not be recognized as a claim for delay. Claims by a contractor for costs due to such delays shall not be paid by the PRA.
- B. Delays, including delays caused by lack of cooperation, shall result in penalties by the PRA as stipulated under paragraph 26e of the Standard Contract Requirements.

1.8 SUBCONTRACTOR'S RESPONSIBILITIES

- A. Comply with the direction of each Prime Contractor in coordination efforts listed above.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 013119
PROJECT MEETINGS

PART 1— GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's administrative and procedural requirements for project meetings. Requirements contained herein in no way limit each Prime Contractor's responsibility to effectively communicate with parties involved in order to meet the requirements of the Contract.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Project Coordination: Division 1.
- C. Construction Scheduling: Division 1.

1.3 ADMINISTRATION

- A. The Project Coordinator will schedule and administer the pre-construction meetings, periodic project meetings, pre-installation, coordination and other specially called meetings throughout the progress of the work. She/he will also:
 - 1. Prepare agenda for meetings.
 - 2. Distribute written notice of each meeting four (4) days in advance of meeting date.
 - 3. Make physical arrangements for meetings.
 - 4. Preside at meetings.
- B. During the course of the pre-construction meetings, periodic project meetings, pre-installation, coordination and other specially called meetings throughout the progress of the work, the Design Professional will:
 - 1. Record the minutes, including all significant proceedings and decisions.
 - 2. Reproduce and distribute copies of minutes within three (3) days after each meeting to: all participants in the meeting; and all parties affected by decisions made at the meeting.
- C. Representatives of Contractors, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.4 PRE-CONSTRUCTION MEETING

- A. Attendance
 - 1. Project Coordinator.
 - 2. Design Professional's Representative.
 - 3. Prime Contractor's Representatives.
 - 4. Major subcontractors.
- B. Suggested Agenda
 - 1. Discussion of coordination of Prime Contracts.

2. Discussion on major subcontracts and suppliers and projected construction schedules.
3. Critical work sequencing.
4. Major equipment deliveries and priorities.
5. Project Coordination and designation of responsible personnel.
6. Procedures and processing of field decisions, proposal requests, submittals, change orders and applications for payment.
7. Procedures for maintaining Record Documents.
8. Use of premises, office, work and storage areas, and City's requirements.
9. Construction facilities.
10. Temporary utilities.
11. Housekeeping procedures.
12. Dispute resolution.

1.5 PROGRESS, PRE-INSTALLATION AND COORDINATION MEETINGS

- A. Schedule regular and special meetings, as required by progress of the Work.
- B. Location of the Meetings - The Project field office of the Contractor [or as otherwise directed].
- C. Attendance
 1. Project Coordinator.
 2. Design Professional's Representative.
 3. Contractor's Representatives.
 4. Subcontractors as appropriate to the agenda.
 5. Suppliers as appropriate to the agenda.
 6. Others as appropriate.
- D. Suggested Agenda
 1. Review and approval of minutes of previous meeting.
 2. Review of work progress since previous meeting.
 3. Field observations, problems, conflicts.
 4. Problems which impede Construction Schedule.
 5. Coordination issues between Prime Contractors.
 6. Review of off-site fabrication, delivery schedules.
 7. Corrective measures and procedures to regain projected schedule.
 8. Revisions to Construction Schedule.
 9. Plan progress, schedule, during succeeding work period.
 10. Coordination of schedules.
 11. Review submittal schedules; expedite as required.

12. Maintenance of quality standards.
13. Review proposed changes for:
 - a. Effect on Construction Schedule and on completion date.
 - b. Effect on other contracts of the Project.
14. Review record drawings.
15. Other business.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 013216
CONSTRUCTION SCHEDULING

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies administrative and procedural requirements for schedules prepared by each Prime Contractor.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 CONSTRUCTION SCHEDULE

- A. Each Prime Contractor shall prepare a Contractor's Construction Schedule including all phases of work as follows:
1. Initial Construction Schedule - Within 14calendar days after Notice to Proceed, submit an initial construction schedule. Break down at least by 16 Division Specification format for General Construction. This schedule must be in agreement with the time frame stated in the Bid Proposal. Coordinate schedule with the following:
 - a. Pre-purchase products.
 - b. Allowances.
 - c. Application for Payments.
 - d. Mock-ups.
 - e. Schedule of Submittals.
 - f. Schedule of Values.
 2. Final Construction Schedule - Within 14 calendar days after Notice to Proceed, submit a complete detailed construction schedule showing each activity having impact upon the timely completion of the Project. Activities shall be broken down generally similar to the individual specification sections but not less than 20 separate operations. The schedule shall include, but not be limited to the following:
 - c. Time frames for shop fabrication and delivery of all parts of the work. Identify by specification section number and title. Coordinate with Schedule of Submittals. Allow time for reviews, resubmissions and approval.
 - d. Decision dates for selection of finishes and colors.
 - e. Decision dates for selection of products specified by allowances.
 - f. Deadlines for submissions of substitutions.
 - g. Identification for work of mock-ups separate phases or other logically grouped activities.
 - h. Separate network for each trade or operation.

1.4 FORMAT

- A. Initial Construction Schedule - Horizontal bar chart form divided vertically by weeks.
- B. Final Construction Schedule - Horizontal bar chart form showing each trade or operation.

1.5 SCHEDULE OF SUBMITTALS

- A. Submit a preliminary Schedule of Submittals within 30 days after the Notice to Proceed. Submit the final schedule with the final Contractor's Construction Schedule.
- B. Coordinate submittal schedule with the list of subcontracts, schedule of values, submittal register and the Contractor's construction schedule.
- C. Coordinate scheduling of interrelated submissions to allow for review of required data and to avoid delays in reviewing submittals caused by lack of coordinated submission.
- D. Coordinate scheduling of submission to allow for approval of products prior to construction of mock-up.
- E. Contractor shall estimate number of resubmissions required for each submittal based on complexity. However, the submittal schedule in no way binds the PRA to approve a submittal to meet the submittal schedule or construction schedule. It is the contractor's sole responsibility to prepare acceptable submissions in a timely fashion in order to maintain schedule.
- F. Allow for City's and Design Professional's review of each submission and resubmission.
- G. Prepare the schedule in chronological order. Provide the following information:
 - 1. Related Section number.
 - 2. Submittal category.
 - 3. Name of subcontractor.
 - 4. Description of the part of the Work covered.
 - 5. Scheduled date for the first submittal.
 - 6. Scheduled date for resubmittal or resubmittals.
 - 7. Scheduled date the PRA's final release or approval.
- H. Distribution - Following response to initial submittal, print and distribute copies to the PRA, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
- I. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

1.6 COORDINATION

- A. All Prime Contractors shall submit their schedules to the General Contractor.

- B. The General Contractor shall prepare an overall schedule including all trades and contracts.
- C. The PRA will resolve conflicts among schedules of various Prime Contractors.
- D. The General Contractor shall distribute copies of the approved final Construction Schedule to other Prime Contractors involved.

1.7 UPDATING

- A. Updating of the final Construction Schedule and Schedule of Submittals shall be required on a monthly basis.
- B. Show all changes occurring since previous submission of updated schedules.
- C. Indicate progress of each activity, show completion dates.
- D. Include major changes in scope, activities modified since previous updating, revised projections due to changes and other identifiable changes.

1.8 DISTRIBUTION

- A. Distribute copies of revised schedules to:
 - 1. Project Coordinator.
 - 2. Design Professional.
 - 3. Other Prime Contractors.
 - 4. Subcontractors.
 - 5. Other Concerned Parties (surety, insurance, etc.).
 - 6. Instruct recipients to report any inability to comply, and provide detailed explanation, with suggested remedies.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 013226
PROGRESS REPORTS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies administrative and procedural requirements for progress reports prepared by each Prime Contractor.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements and other Division 1 sections

1.3 DAILY REPORT

- A. Each Prime Contractor shall prepare a Daily Report including:
1. Name of project.
 2. PRA Project number.
 3. Date of report.
 4. Weather conditions.
 5. Manpower status on each type of work being performed.
 6. Overtime worked, and planned.
 7. Work progress.
 8. Environmental problems and corrections.
 9. Other information, such as special events or occurrences, accidents, recommendations, suggestions, visitors, major equipment or materials received, tests, inspections, equipment start-up and check out, occupancy.
- B. Submit copies of reports weekly to Project Coordinator and Design Professional.

1.4 MONTHLY REPORT

- A. Each Prime Contractor shall prepare a synopsis of the previous month's activities, including:
1. Name of project.
 2. PRA Project number.
 3. Date of report.
 4. Weather conditions for the month compared to normal.
 5. Work progress from previous month.
 6. Copies of all previous month's schedules.
 7. Updated schedules with explanations of deviation from previous.
 8. Milestone schedule events for the upcoming month.

9. Corrective measures and procedures to regain projected construction schedule.
10. Review of status of submittals.
11. Review of status of Change Orders and/or requested Change Orders.
12. Other information of importance from previous month or forecasted for upcoming month.
13. Bind in submission of Construction Photographs.
14. Bind in submission of monthly settlement survey.

B. Submit copies of reports monthly to Project Coordinator and Design Professional.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -



SECTION 013233
CONSTRUCTION PHOTOGRAPHS

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes photographic services provided by the General Contractor required to record the progress of the work of all Prime Contractors.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBMITTALS

- A. Digital images - Three (3) hard copies of each view. Forward one (1) print each to PRA and Design Professional and retain one (1) for Contractor's files. Submit also catalog of all views on PC-Formatted Compact Disc (s).
- B. Submit hard copy images and DVD or CD with each monthly progress report.

PART 2—PRODUCTS

2.1 DIGITAL IMAGES (HARDCOPY)

- A. color
- B. Minimum image size shall be 3 inches by 5 inches.
- C. Identify each image listing:
 - 1. Name of project.
 - 2. Orientation of view.
 - 3. Date and time recorded.

PART 3—EXECUTION

3.1 DIGITAL IMAGES (HARDCOPY)

- A. Take 72 initial photographs and 36 photographs once monthly or at designated points in the work when critical systems or conditions are exposed, from points designated by the Project Coordinator or Design Professional, for the length of the Contract. First photographs shall be taken prior to start of construction.
- B. Retain electronic files on PC-Formatted Compact Disc for three (3) years and make additional copies as may be requested by PRA or Design Professional at cost of reproduction.

END OF SECTION



SECTION 013330
SUBMITTALS

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's administrative and procedural requirements for submission of shop drawings, product data, samples and other required information.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Submittal Schedule specified in Construction Scheduling, Section 013216.

1.3 WORK WITHOUT APPROVED SUBMITTALS

- A. PRA may withhold payment for the value of Work installed without first obtaining approved submittals, when submittal is required by individual specification sections. Refer to section 012900 "Payment Procedures".

1.4 SHOP DRAWINGS

- A. Shop drawings are Contractor's or subcontractor's Drawings made specifically for this Project, for use in fabrication and installation.
- B. Shop drawings must show sufficient data including layout, fabrication and erection details to establish evidence of conformance with design concept and compliance with the Contract Documents. Shop drawings must show relationships with adjacent construction.
- C. Do not use reproductions of Contract Drawings as Shop Drawings unless specifically permitted in the Contract Documents.
- D. Identify details by reference to sheet and detail numbers shown on Contract Drawings and by reference to paragraphs and specification section.
- E. Orient Shop Drawings in same manner as drawings.
- F. Manufacturer's Standard Schematic Drawings
 - 1. Modify drawings to delete information that is not applicable to Project. Drawings showing information which is not applicable or unaltered standard drawings shall be returned without review.
 - 2. Add supplemental information applicable to Project.

1.5 PRODUCT DATA

- A. Manufacturer's Catalog Sheets, Brochures, Diagrams, Schedules, Performance Charts, Illustrations and Other Standard Descriptive Data.
- B. Clearly mark each copy to identify materials, products or models applicable to this Project. Submittals not marked shall be returned without review.
- C. Show colors when required for evaluation, record or other purpose. Where product data is printed in color, submit all copies in original colors as published.
- D. Show dimensions and clearances required.
- E. Show performance, characteristics and capacities.

- F. Show wiring and piping diagrams, and controls.
 - G. Show by reference to paragraphs and specification section.
- 1.6 SAMPLES
- A. Samples: Actual samples of products proposed for use. Samples must be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of product or material, with integrally related parts and attachment devices.
 - 2. Full range of color, texture and patterns.
- 1.7 FIELD SAMPLES AND MOCKUPS
- A. Erect at project site in location as directed.
 - B. Construct each sample or mock-up complete, including work of all trades required in the finished work.
 - C. Remove mockup at conclusion of work or when directed by City.
- 1.8 COORDINATION
- A. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 - C. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - D. The PRA reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 - E. When mock-ups are required, submittals for all products used in mock-up shall be coordinated with schedule for mock-up construction.
- 1.9 SUBMISSION REQUIREMENTS
- A. Comply with Schedule of Submittals.
 - B. Accompany each submission with a transmittal indicating project name, location, PRA's project number, referenced specification number, submission number, date, item submitted, Contractor's name, Sub-contractor, supplier or manufacturer.
 - 1. Transmittal shall include Contractors certification that information complies with Contract Documents.
 - 2. Indicate on transmittal or on submittal deviations from Contract Documents requirements.
 - C. Copies
 - 1. For hard copy submission, submit five (5) prints of each shop drawing.
 - 2. Submit [five (5)] copies of product data. [One (1)] copy will be retained by Design Professional.

3. Electronic Submission. Electronic submission of shop drawings and product data is permitted. Submit in PDF or other authorized format with transmittal as indicated in B above. Electronic submission of samples and color charts is not permitted.
 4. For sample selections, submit [one (1)] set. For sample approval, submit [three (3)] sets. The Design Professional will retain one (1) set.
- D. Where product data is printed in color and requires color for evaluation, record, or other purpose, all copies submitted shall be in original colors as published.
- E. In addition to information required on the transmittal, submittals shall include:
1. Relation to adjacent structure or materials.
 2. Field dimensions, clearly identified as such.
 3. Finishes.
 4. Shipping and operating weights
 5. Gauges, fastenings, reinforcements, welding details.
 6. Applicable standards, such as ASTM or Federal Specification numbers.
 7. A blank space, 3 inches by 10 inches for action stamp.
- F. Contractor's Review:
1. Contractor shall review each submittal and indicate approval with a stamp, dated, initialed and/or signed. Review shall include but not be limited to; verification of field measurements, coordination with all trades involved and compliance with Contract Documents. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the PRA's or Design Professional's action on submittals unless the Contractor has given specific notice of deviation at the time of submission and written approval of the specific deviation is given. The Contractor shall not be relieved from responsibility for errors or omissions in submittals by the PRA's or Design Professional's approval thereof.
 2. If Contractor does not review submittals and provide the signed approval stamp before sending them to the Design Professional, they will be returned unchecked.

1.10 SUBMISSION ROUTING

- A. Forward submittal direct to Design Professional and fax copy of transmittal letter to Project Coordinator.
- B. Design Professional will forward Submittals marked as "Approved" or Approved as Noted to Project Coordinator.
- C. Design Professional will forward Submittals marked as "Revise and Resubmit" or "Rejected" back to Contractor and will fax copy of transmittal to Project Coordinator.
- D. Project Coordinator will forward Submittals back to Contractor and will fax copy of transmittal to Design Professional.

- E. Electronic submittals are permitted. –Must have stamp of general contractor.
Submittal Routing summary:
Approved: Contractor. → Design Prof →DPP→Contractor.
Rejected: Contractor. →Design Prof →Contractor. and copy of transmittal to DPP.

1.11 DESIGN PROFESSIONAL'S DUTIES

- A. Review submittals within 10 working days of receipt.
- B. Review for conformance to design concept of Project and for compliance with information given in Contract Documents. Review of separate item does not constitute review of an assembly in which item functions.
- C. Affix stamp and initials or signature certifying to review of submittal.
- D. Design Professional's action on submittals will result in the making of one of the following notations with related meanings:
 - 1. NO EXCEPTION TAKEN: The work involved may proceed, and no further submission is required.
 - 2. EXCEPTION TAKEN AS NOTED: The work involved may proceed incorporating comments. Annotations do not authorize changes to Contract Sum.
 - 3. REVISE AND RESUBMIT: The work involved may not proceed. Submittal must be corrected and resubmitted.
 - 4. REJECTED: The submittal is not in accordance with the Contract Documents, and a completely new submittal is required.
- E. In the event any comment made to the Submittal results in a claim for a change in the Contract, the Project Coordinator shall be notified immediately and fabrication may not be undertaken until contract modification procedures are completed.

1.12. PRA'S RESPONSIBILITY

- A. Review submittals within 5 working days of receipt.
- B. Review for compliance Contract Documents. Review of separate item does not constitute review of an assembly in which item functions.
- C. Affix stamp and initials or signature certifying to review of submittal.
- D. PRA's action on submittals will result in the making of one of the following notations with related meanings:
 - 1. APPROVED FOR CONSTRUCTION: The work involved may proceed, and no further submission is required.
 - 2. APPROVED AS NOTED: The work involved may proceed incorporating comments. Annotations do not authorize changes to Contract Sum.
 - 3. REVISE AND RESUBMIT: The work involved may not proceed. Submittal must be corrected and resubmitted.

1.13 RESUBMISSION REQUIREMENTS

- A. Identification of Changes - Clearly identify changes made from the initial submittal other than those requested by the Design Professional. The Design Professional will review only those changes requested and those identified by the Contractor.

1.14 DISTRIBUTION OF APPROVED SUBMITTALS

- A. Contractor shall reproduce and distribute copies of submittals having the Design Professional's and PRA's stamp ("Approved" or "Approved as Noted") as required to coordinate and complete the Work and to records documents file.

1.15 SUBSTITUTIONS

- A. Substitutions submitted as a shop drawing, product data or sample will be returned without action.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 014100
CODES, REGULATIONS AND STANDARDS

PART 1— GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's responsibilities regarding codes, regulations and standards included in the Contract Documents by reference.

1.2 RELATED REQUIREMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. All technical sections.

1.3 APPLICABLE CODES AND REGULATIONS

- A. The following codes and regulations are applicable to the project. The list does not represent all codes, regulations and standards:
1. The Philadelphia Building Construction and Occupancy Code
 - a. The Philadelphia Administrative Code
 - b. The Philadelphia Building Code
 - c. The Philadelphia Electrical Code
 - d. The Philadelphia Fire Prevention Code
 - e. The Philadelphia Mechanical Code
 - f. The Philadelphia Plumbing Code
 - g. The Philadelphia Property Management Code
 2. NFPA 241, Standard for Safe Guarding Construction, Alterations, and Demolition Operations.
- B. It is not the intent of the Contract Documents to conflict with any Code, or Regulation. Report any conflicts to Design Professional for clarification.

1.4 REFERENCED STANDARDS

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes or intended use.
- B. The referenced standards shall have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- C. Should specified reference standards conflict with Contract Documents, request clarification from Design Professional before proceeding but generally the more stringent requirement shall apply.
- D. In the absence of specific instructions in the specifications, materials, products, equipment, and their installation shall conform to the applicable codes, regulations and standards specified herein.

- E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any referenced document.
- F. Dates of codes, regulations and standards specified shall be the latest date prior to the date of issue of this Project Manual, except where, prior to the date of issue of this Project Manual, modified or otherwise directed by the applicable codes and their supplements and amendments adopted by the code authorities having jurisdiction.
- G. Each entity engaged in construction of the Project shall be familiar with industry standards applicable to its construction activity. If unfamiliar, obtain copies and review with all workers. Obtain copies of standards when required by individual specification sections. Maintain copy at job site until Substantial Completion.
- H. Associations, Institutions, and Societies and their abbreviations if any, appearing in the Project Manual or elsewhere in the Contract Documents, shall be as generally recognized in the industry. Refer to the “Encyclopedia of Associations” published by Gale Research Company for abbreviations, addresses and phone numbers.

PART 2—PRODUCTS Not Used

PART 3—PRODUCTS Not Used

END OF SECTION



SECTION 014516
CONTRACTOR'S QUALITY CONTROL

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This section describes each Prime Contractor's requirements for quality assurance including:
 - 1. Control of installation
 - 2. Tolerances
 - 3. Mockups
 - 4. Inspection and Testing services
 - 5. Manufacturer's field services

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Each technical section required for materials and products in mockup
- C. Each technical section requiring independent inspection and testing.

1.3 QUALITY ASSURANCE – CONTROL OF INSTALLATION

- A. Each Prime Contractor is responsible to deliver Work of quality specified regardless Contractor's sub-contracting or purchasing arrangements.
- B. Monitor quality control over suppliers, manufacturer's products, services, site conditions and workmanship to produce Work of specified quality.
- C. Comply with manufacturers written instructions, including preparation and each step in sequence.
 - 1. Should manufacturer instructions differ from Contract Documents, request clarification but assume the more stringent will apply.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.

1.4 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable Work. Do not allow tolerances to accumulate.
- B. Comply with manufacturers written tolerances.
 - 1. Should manufacturer tolerances differ from Contract Documents, request clarification but assume the more stringent will apply.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.5 MOCK-UPS

- A. Construct mock-up to meet all indicated requirements, identical to proposed final Work.
- B. Locate mock-up on-site at location directed.
- C. Mock-up may be incorporated into final Work after acceptance by PRA.
- D. Extent of mock-up shall be as indicated on drawings or in specifications.
- E. Obtain approval of mock-up before performing construction involving products and systems included in mock-up.
- F. Approved mock-up shall establish the required quality of final Work, notwithstanding other requirements of the specifications.
- G. Maintain approved mock-up until all work included in the mock-up has been completed and accepted.

1.6 INSPECTION AND TESTING SERVICES

- A. Each Prime Contractor shall retain independent inspection and testing services when required by individual specification sections or by building code authority.
- B. The independent agency shall perform inspection and testing services on and off site as required by individual specification sections and as required to comply with requirements of the building code authority.
- C. Independent agency shall submit reports to Prime Contractor and direct to PRA indicating compliance or non-compliance. Notify PRA the same day of non-compliance.
- D. Cooperate with independent agency; furnish samples, mix designs, equipment, tools, storage, safe access, and assistance by incidental labor.
- E. Inspection and testing does not relieve Contractor to perform Work to contract requirements.
- F. Retesting required because of non-conformance to specified requirements shall be performed by the original agency at no additional cost to PRA.

1.7 MANUFACTURERS FIELD SERVICES

- A. When specified in individual specification sections, require manufacturer to provide qualified technical staff personnel to observe site conditions, quality of workmanship, start-up or training of PRA personnel as specified.
- B. Technical staff shall not be the local sales staff or independent manufacturers sales representatives.
- C. Manufacturers technical representative shall submit written reports of findings to Contractor and direct to PRA. Notify PRA the same day of non-compliance

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's construction facilities and services required for performance of the Work but not a permanent part of the finished construction. Included are temporary utilities, temporary construction and support facilities and security and protection services.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Environmental Controls: Division 1.

1.3 SUBMITTALS

- A. Submit reports of tests, inspection, meter readings and similar procedures performed on temporary utilities.

1.4 INSPECTION

- A. Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certificates and permits.

PART 2—PRODUCTS

2.1 TEMPORARY MATERIALS

- A. Materials may be new or used, but must be adequate for the required usage and must not violate requirements of applicable codes and standards. Generally, temporary materials shall comply with related specification sections for materials to be incorporated into final work.

PART 3—EXECUTION

3.1 TEMPORARY UTILITIES

- A. PRA will not charge Contractor for utilities used. Contractor shall not waste or misuse utilities.

3.2 TEMPORARY ELECTRICIPRA

- A. Provide electrical service adequate for work of all trades, and terminate in fused safety switch and circuit breaker distribution panels as required.
- B. For welding at site or electrical requirements beyond the area of temporary system, supply generator, fuel, maintenance, and other incidentals required.

3.3 TEMPORARY LIGHTING

- A. Provide temporary lighting if required for construction operations
- B. Permanent building lighting may be utilized during construction.

3.4 HEATING AND VENTILATING

- A. Provide temporary heat as if required for construction operations. Temporary sources of heat shall be direct vented and thermostatically controlled. Open flame devices or solid fuels are not allowed.
 - B. Provide forced ventilation by portions of the permanent system or by portable units, to cure materials, to disperse humidity, and to prevent accumulations of dust, fumes, vapors, or gases. Provide ductwork with temporary filters to prevent the broadcasting of dust and debris.
 - C. In occupied facilities, while performing operations that generate fumes or dust, provide both fresh air intake and fan powered ventilation to control spread of fumes or dust to occupied areas of the building.
- 3.5 TEMPORARY TELEPHONE
- A. Provide telephone service and a facsimile machine on-site for Contractor's, PRA's and Design Professional's use. Contractor shall pay cost of service.
 - B. PRA telephones on-site may not be used by Contractors.
- 3.6 TEMPORARY WATER SUPPLY
- A. Provide temporary water service of adequate size as required for fire protection and construction operations. Temporary connections may be made to building systems where appropriate. Temporary connections must be acceptable to Plumbing Inspector.
 - B. Provide drinking water, paper cups, and waste receptacles for personnel.
- 3.7 SANITARY FACILITIES
- A. Enforce use of sanitary facilities. Evidence to the contrary shall require removal, disinfecting, and reconstruction of defaced work.
 - B. The use of the Owner's toilet facilities by construction personnel will be permitted.
- 3.8 FIRE PROTECTION
- A. Provide temporary fire protection and portable fire extinguishers according to law.
- 3.9 CONSTRUCTION AIDS
- A. Provide construction aids required for execution of the work, including scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other facilities and equipment as required.
- 3.10 BARRIERS
- A. Provide barriers to prevent unauthorized entry to construction areas while allowing for PRA's use of site, and to protect existing facilities and adjacent properties from damage from construction and demolition operations.
 - B. Coordinate with Fire Department to maintain access to the building entrance and egress from fire doors at all times.
 - C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
- 3.11 FENCING

- A. Construction - Commercial grade chain link
 - B. Provide 6 foot high temporary type fence around construction site; equip with pedestrian gates with locks.
- 3.12 EXTERIOR ENCLOSURES
- A. Provide temporary weather tight closure if required to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
 - B. Provide temporary tarps or other protection to roofs and unprotected deck areas made open to weather by construction operations.
- 3.13 PROTECTION OF INSTALLED WORK
- A. Protect installed Work and provide special protection where specified in individual specification sections.
 - B. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
 - C. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by covering with durable sheet materials.
 - D. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
 - E. Prohibit traffic from landscaped areas.
- 3.14 SITE SECURITY
- A. The PRA assumes no responsibility for loss, theft, or damage to the work, tools, equipment, and construction. In the instance of any such loss, theft, or damage, the Contractor shall be responsible to renew, restore, or remedy the work, tools, equipment, and construction in accordance with requirements of the Contract Documents without additional cost to the PRA.
 - B. The Contractor, at his own cost, may provide watchman services, and other means of site security.
 - C. Site parked equipment, operable machinery, and hazardous parts of the new construction subject to mischief and accidental operation, shall be inaccessible, locked, or otherwise made inoperable when left unattended.
 - D. Liability - The PRA is not responsible for damage, liability, theft, casualty, or other hazard to the automobiles or other vehicles, nor to injury including death to occupants of automobiles or other vehicles on the PRA's property. Provide signs to this effect in the designated parking area.
- 3.15 ACCESS ROADS AND PARKING AREAS
- A. Access Roads
 - 1. Use existing roads on Site for access. Protect roads from damage from extra heavy loading by use of timbers or other approved means.

B. Parking Areas

1. PRA will permit use of a designated area of the existing parking lot on the Site for exclusive parking of workmen's automobiles and of the automobiles of the Design Professional, Consultants, and other visitors having business at the Site.

3.16 PROJECT SIGN

- A. Provide project identification sign, and temporary information and direction signs as required and approved. See Specification section 01580 for requirements.

3.17 FIELD OFFICE

- A. Contractor shall provide a field office on the site where directed as required to complete the Work.

3.18 TERMINATION AND REMOVAL

- A. Remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, but no later than Substantial Completion. Complete or restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
- B. Materials and facilities that constitute temporary facilities are property of the Contractor
- C. Remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances, as required by the governing authority.

END OF SECTION



SECTION 015719
ENVIRONMENTAL CONTROLS

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractors requirement for protection of the atmosphere, waterways, groundwater, plants, animal habitats, soils, etc., both on and off site.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Earthwork and Grading in Division 2.

1.3 REGULATORY AGENCIES AND CODES

- A. Comply with the following in accordance with Division 1:
 - 1. United States Department of Agriculture (USDA)
 - 2. Urban Hydrology for Small Watersheds, Technical Release No. 55, Engineering Division, Soil Conservation Service.
 - 3. National Engineering Handbooks, Section 4 (Hydrology); Section 5 (Hydraulics); Section 16 (Drainage), Soil Conservation Service.
 - 4. City of Philadelphia

1.4 DEFINITIONS

- A. Sediment - Soil that has been eroded and transported by runoff water.
- B. Degradable Debris - Debris which can undergo biodegradation or combustion, or which can be dissolved in or suspended by water.
- C. Nondegradable Debris - Inorganic debris which will not disintegrate nor dissolve when exposed to moisture or water.
- D. Chemicals - Petroleum or cementitious products, bituminous materials, salts, acids, alkalis, herbicides and pesticides.
- E. Waste - Sewage, including domestic sanitary sewage, garbage, and trash.

PART 2—PRODUCTS

2.1. MATERIALS

- A. Silt Fences: Three (3) foot wide fabric designed to filter sediment, as manufactured by Mirafi, Inc. Amoco, or Exxon.
- B. Earth Stabilizer: Rye grass seed, hay, straw mulch, chemical stabilizer, or other devices approved by the environmental protection agency having jurisdiction and by the Design Professional.
- C. RipRap: Sizes as shown on drawings.

PART 3—EXECUTION

3.1 GENERAL

- A. Establish and enforce ecological preservation measures which will avoid

pollution of the atmosphere, waterways, groundwater, plants, soils, animal habitats, landfills, wetlands, the site, adjacent sites, roadways, etc.

- B. Prevent spilling of chemicals or waste. Provide emergency plans and methods for abatement of accidental spills of toxic substances.

3.2 SEDIMENT CONTROL

- A. Until permanent work establishes sediment control, provide temporary control, using vegetative cover with seeding, mulch, and binder within [ten (10)] days after completion of grading of any given area.
- B. As a temporary measure, provide silt fences, arranged along the toe of surface drainage ways and inlets, in such a manner that water will pass through the silt fences and filter the sediment. Embed silt fence in ground 6 inches deep and anchor to the ground with posts, as shown on the drawings. Replace silt fences when they become clogged and ineffective.
- C. During pipe laying work, prevent silt from entering the piping systems by use of hay bales, silt fence, temporary closures of pipe ends, or other means as best suited to the conditions.

3.3 DUST CONTROL

- A. Keep dust down at all times, including non-working days, weekends, and holidays. Wet down or treat disturbed soil with dust suppressers as required and approved.
- B. Do not leave areas of disturbed earth unworked for long periods of time. Provide temporary or permanent earth stabilization promptly.
- C. In sandblasting operations, confine the dust.
- D. Use wet-cutting methods for cutting concrete, asphalt, and masonry.
- E. Do not shake out bags containing dust-causing substances.

3.4 NOISE CONTROL

- A. Provide mufflers on internal combustion engine equipment. Maximum noise level shall be 90 dbA at 50 feet.
- B. Limit hours of operation of noisy construction to limits set by City ordinance.

3.5 INDOOR AIR POLLUTION

- A. Guard against indoor air pollution by protecting air intakes from dust and harmful vapors.
- B. Coordinate with Fire Department and DPP to shut down air intakes temporarily if protection cannot be maintained.
- C. Facility is City's 24/7 Fire Dispatch Center and Emergency Management Center do not compromise habitability of work areas required for these functions.

3.6 DISPOSAL OF DEBRIS, CHEMICALS AND WASTE

- A. Legally dispose of debris, chemicals, and waste off the site
- B. Collect and contain materials before disposal in orderly fashion and by means which prevent contamination of air, water and soil.

- C. Store chemicals in watertight containers.
 - D. Do not burn materials on the site.
- 3.7 TRUCKS
- A. Dump trucks shall be tarpaulin-covered so that spillage does not occur.
- 3.8 MAINTENANCE AND TERMINATION
- A. Maintain in working order environmental protection measures until they are no longer required.
 - B. Terminate environmental control measures when there is no longer a threat of pollution. Remove temporary control measures. Complete or, if necessary, restore permanent construction that may have been delayed or damaged because of interference with environmental controls.

END OF SECTION



SECTION 016001
PRODUCTS AND MATERIALS

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes administrative procedures regarding each Prime Contractor's selection of products, materials, and equipment required for the completion of the Work. Requirements for handling, storing and installing products are also included.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties", "structure", "finishes", "accessories", and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.
- B. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material", "equipment", "system", and terms of similar intent.
- C. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature.
- D. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- E. "Equipment" is a product with operational parts, whether motorized or manually operated, that require service connections such as wiring or piping.
- F. "System" is an integrated assembly of materials and/or equipment which when combined form an integral whole to serve a function.

1.4 QUALITY ASSURANCE

- A. Source Limitations - To the fullest extent possible, provide products of the same kind, from a single source.
- B. Compatibility of Options - When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- C. Each Prime Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate Contractors.
- D. If a dispute arises between prime Contractors over concurrently selectable, but incompatible products, the Design Professional will determine which products shall be retained and which are incompatible and must be replaced.

- E. Nameplates - Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.
 - F. Labels - Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
 - G. Equipment Nameplates - Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - 1. Name of product and manufacturer.
 - 2. Model and serial number.
 - 3. Capacity.
 - 4. Speed.
 - 5. Ratings.
- 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING
- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
 - B. Schedule delivery in accordance with the Construction Schedule and to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
 - C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
 - D. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with legible labels and instructions for handling, storing, unpacking, protecting and installing.
 - E. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
 - F. Store products at the site in a manner that will facilitate inspection and measurement of quantity of counting of units.
 - G. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
 - H. Store product subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
- 1.6 OPERATION, MAINTENANCE, TRAINING AND CALIBRATION
- A. Furnish manuals and services specified and as required to start-up, operate and maintain all equipment and systems.

PART 2—PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

- A. Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation. All products shall be certified asbestos-free.
- B. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
- C. Where the work requires testing for assurance of performance, that portion of the work shall not proceed until such testing has been completed and written test report has been approved.
- D. Do not use material or equipment for any purpose other than for which it is designed or specified.
- E. Certification of Compatibility: If indicated, the material and equipment manufacturers shall certify in writing that:
 - 1. Other manufacturer's materials or equipment coming into contact with their product are compatible with their product in every way and that the intended performance of the system in which their product is incorporated will not be affected as a result of such contact. Also, physical breakdown of their product by chemical reaction or otherwise will not occur as a result of such contact.
 - 2. The combination of products by one (1) manufacturer to make up the manufacturer's specified system, will contribute to the performance of the system as intended, and will remain operational, reliable and durable. The manufacturer will be the source of routine maintenance and replacement parts.
- F. Reuse of Existing Material
 - 1. Except where indicated or otherwise approved in writing, materials and equipment removed from an existing structure shall not be used in the work.
 - 2. Where use of existing material is indicated or approved, use special care in removing, handling, storing, and reinstallation to assure proper function in the completed work.

2.2 PRODUCT SELECTION PROCEDURES

- A. Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
- B. Where products or manufacturers are specified by name, description, or performance accompanied by the term "or equivalent substitution", "or approved substitution", "or approved equal" or similar terms comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
- C. Proprietary Specification Requirements - Where products or manufacturers are named, provide the product indicated or submit a substitution request.

- D. Descriptive Specification Requirements - Where Specifications describe a product or assembly, listing exact characteristics required, without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements. If descriptive specification also includes manufacturers or products, provide product indicated of submit a substitution request.
- E. Performance Specification Requirements - Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. Compliance shall be certified by independent testing agencies furnished by manufacturer. General overall performance of a product is implied where the product is specified for a specific application.
- F. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
- G. Compliance with Standards, Codes and Regulations - Where the Specifications require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified. Compliance shall be certified by independent testing agencies furnished by manufacturer.
- H. Visual Matching - Where Specifications require matching an established sample or existing construction, the Design Professional's decision will be final on whether a proposed product matches satisfactorily.
- I. Visual Selection - Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Design Professional will select the color, pattern and texture from the product line selected.
- J. Allowances - Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection, and for procedures required for processing such selections.

PART 3—EXECUTION

3.1 ACCEPTABLE INSTALLERS

- A. Installers shall be familiar with products and experienced in their installation. Comply with more stringent requirements of individual sections for installer qualifications.

3.2 EXAMINATION OF SUBSTRATE

- A. Each installer shall examine substrate onto which the product will be installed. Inspect for any condition which would in any way reduce the quality, performance or durability of the product including but not limited to; dimensional or location tolerances, dampness, dryness, installation not meeting specified criteria for substrate, poor workmanship, etc. Do not proceed with installation over unacceptable substrates. Notify Contractor to have substrate repaired. Work installed over unacceptable substrates shall be redone after substrate is repaired at no cost to the City.

3.3 PREPARATION

- A. Protect adjacent work from possible damage which installation could cause including but not limited to staining, overspray, denting, gouging, displacement, etc.
- B. Clean and prepare substrates to receive products with primers, bonding agents, barrier coats, etc. as per manufacturer's instructions.

3.4 PASSAGE OF MATERIALS AND EQUIPMENT

- A. Establish passage clearances required to deliver and install materials and equipment.
- B. Where there will be insufficient clearance for passage of materials and equipment, deliver and protect such equipment before confining construction is installed.
- C. If existing structures, equipment and systems must be altered to provide passage of new materials and equipment, engage those skilled in the respective trade to restore structures, equipment, and systems to their original condition at no additional cost. Do not alter structure, equipment, or systems without written approval.
- D. In lieu of altering structures to provide passage of materials and equipment, provide materials and equipment that can be disassembled, brought into the building, and reassembled.
- E. If exterior windows or doors must be removed to provide passage of materials and equipment into the building, store and protect removed work at the site and reinstall as soon as possible. If any damage occurs to the work during their removal, transit, storage or reinstallation, replace or repair the work to like new condition at no cost to Owner.

3.5 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations and requirements of individual specification sections in the applications indicated. If manufacturer's instructions and specifications indicate differing installation techniques, request clarification from Design Professional but generally comply with more stringent requirement.
- B. Anchor each product securely in place accurately located and aligned with other Work.
- C. Coordinate installation with surrounding Work to allow for optimum end product.

3.6 FIELD QUALITY CONTROL

- A. Have manufacturer's technical representative on-site to observe crucial installation steps as required by individual specification sections or as required to meet manufacturer's warranty or to meet other indicated criteria.

3.7 ADJUSTING

- A. Adjust installed products for proper operation and fit.

END OF SECTION



SECTION 017700
CLOSEOUT PROCEDURES

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's administrative and procedural requirements for project closeout.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBSTANTIAL COMPLETION

- A. When the work is considered substantially complete, submit a written notice to Project Coordinator that the Work, or a designated portion thereof, is substantially complete. Include a list of all items that require completion or correction.
- B. Within a reasonable time after receipt of such notice, an inspection by the PRA will be made to determine the status of completion.
- C. If the Work is not considered substantially complete; the Contractor will be notified in writing, giving the reasons therefore.
- D. Contractor shall remedy the deficiencies in the Work, and send a second written notice of substantial completion. This notice shall include a statement of action taken on each item noted as requiring correction or completion to achieve "Substantial Completion" status.
- E. The Work will be inspected a second time and if not considered substantially complete, the two steps in paragraphs A and B above will be repeated.
- F. When the Project Coordinator concurs that the Work is substantially complete, he/she will:
1. Prepare a Certificate of Substantial Completion on PRA form, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Project Coordinator.
 2. Submit the Certificate to Contractor for written notice of the responsibilities assigned in the Certificate.
- G. Contractor shall prepare Application for Payment at Substantial Completion and complete administrative and submittal requirements per Section 012900 "Payment Procedures".

1.4 FINAL OBSERVATION

- A. When the Work is considered complete, submit written certification that:
1. Contract Documents have been reviewed.
 2. Work has been inspected by the Contractor and has been completed in compliance with Contract Documents.

3. Equipment and systems have been tested in the presence of the Project Coordinator and are operational.
 4. Work is ready for final observation.
- B. Inspection by the PRA will be made to verify the status of completion with reasonable promptness after receipt of such certification.
 - C. If the Work is not considered complete; the Contractor will be notified in writing, listing the incomplete or defective Work.
 - D. Contractor shall take immediate steps to remedy the stated deficiencies, and, after correcting deficiencies, he shall send a second written certification that the Work is complete. This certification shall itemize each deficiency noted and a statement of action taken to remedy or complete the Work.
 - E. The Work will be observed a second time and if not considered substantially complete, the two steps in paragraphs A and B above will be repeated.
 - F. When the Work is acceptable under the Contract Documents, the Contractor shall be requested to make closeout submittals.

1.5 ADDITIONAL OBSERVATION FEES

- A. Should more than two observations at substantial or final completion and/or for required mock ups be required due to failure of the Work to comply with the claims of status of completion made by the Contractor:
 1. PRA will compensate the Design Professional for such additional services.
 2. PRA will deduct the amount of such compensation from the final payment to the Contractor.

1.6 CLOSEOUT SUBMITTALS

- A. When the Work is complete submit the following:
 1. Evidence of compliance with requirement of governing authorities as follows:
 - a. Certificate of Occupancy.
 - b. Certificates of Inspection for Work requiring Certificate of Inspection by governing authority.
 - c. Certificate and Reports of Inspection, Testing and Approval.
 2. Project Record Documents as specified under Division 1.
 3. Operating and Maintenance Manuals as specified under Division 1.
 4. Warranties as specified under Division 1.
 5. Spare Parts and Maintenance Materials as specified.
 6. Evidence of Payment and Release of Liens to the requirements of General and Supplementary Conditions.
 7. Requirements for Final Payment Application per Section 01290 Payment Procedures, Division 1.
 8. Consent of Surety.

HEALTH CARE CENTER NO. 10

INTERIOR IMPROVEMENTS AND ADDITIONS

017700-2

CLOSEOUT PROCEDURES

1.7 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Furnish spare parts and maintenance materials as specified under various Sections of the Specifications.
- B. Package and label parts and materials as directed and store in area of the building where directed by the Project Coordinator.

1.8 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting.
- B. Statement shall reflect all adjustments to the Contract Sum:
 - 1. The original Contract Sum.
 - 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Change Orders caused by substitutions including deductions for review.
 - 3. Deductions for uncorrected Work.
 - 4. Deductions for re-inspection payments.
 - 5. Other adjustments.
 - 6. Total Contract Sum, as adjusted.
 - 7. Previous payments.
 - 8. Sum remaining due.
- C. The Project Coordinator will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.9 FINAL APPLICATION FOR PAYMENT

- A. Submit the final Application for Payment in accordance with procedures and requirements stated herein.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION

- 3.1 Sample Certificate of Substantial Completion Form, see Project Coordinator for actual form.

CERTIFICATE OF SUBSTANTIAL COMPLETION

CITY OF PHILADELPHIA
Department of Public Property
ONE PARKWAY, 1515 ARCH
STREET
PHILADELPHIA, PA 19102



Architect/Engineer:

[Design Consultant
Street Address
City, State, Zip Code]

Owner:

City of Philadelphia / Dept. Of Public Property
One Parkway Building / 1515 Arch Street
Philadelphia, PA 19102

Location:

[Using Agency Name
Name of Facility
Address of Facility
Philadelphia, PA Zip Code]

Inspection Date: [Date]

DPP Project Number: [00-00-0000-00]

Contract Number: [00-0000]

Purchase Order Number: [POXX00000000]

Contractor:

[Name of Company
Address of Company
City, State, Zip Code]

Contract Description (Project Title):

The Work performed under this contract or designated portion of the contract has been observed by the Architect/ Engineer and to the best of his/her knowledge, information and belief the Work is hereby found to be substantially completed on the above date in accordance to the contract documents.

This certificate does not denote final acceptance. The date of Substantial Completion is the date of the start of the warranty and guarantee periods required by the contract documents, except as listed below:

[Enter Information or None]

The list of items to be completed or corrected is attached as exhibit "A". All items listed are to be completed no later than [00/00/00.] The completion of these items on the proposed date constitutes the effective warranty date for said items.

A list of items to be completed or corrected, commonly known as a punch list, is attached hereto. This list may not be exhaustive, and the failure to include an item on it does not alter the responsibility of the Contractor to complete all of the work in accordance with the contract documents.

[Design Consultant
Street Address
City, State, Zip Code]

Authorized Representative Date

The Contractor accepts this Certificate of Substantial Completion and agrees to complete and/ or correct the items on the list by [00/00/00].

[Name of Contractor
Address of Company
City, State, Zip Code]

Authorized Representative Date

The Owner accepts the Work as substantially complete and will assume full possession of the building on the date of [00/00/00]. The Owner accepts responsibility for utilities, security and insurance hereafter. All applicable warranties required by the contract documents become effective on the above date.

City of Philadelphia
Dept. Of Public Property
One Parkway Building
1515 Arch Street
Philadelphia, PA 19102

Authorized Representative (Project Coordinator) Date

Definition of Substantial Completion

The date of substantial completion of a project or specified area of a project is the date when the contract is sufficiently completed, in accordance with the contract documents, as modified by any change orders agreed to by the parties, so that the Owner can occupy or utilize the project or specified area of the project for the use for which it was intended.

cc. File-Project # Sect. 4.18

END OF SECTION

HEALTH CARE CENTER NO. 10

INTERIOR IMPROVEMENTS AND ADDITIONS

017700-4

CLOSEOUT PROCEDURES



SECTION 017823
OPERATION AND MAINTENANCE MANUALS

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's procedural requirements for compiling and submitting operation and maintenance data.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Individual Specifications Sections: Specific requirements for operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.4 FORMAT

- A. Prepare data in the form of an instructional manual.
- B. Binders: Commercial quality, 8-1/2 by 11 inch three ring binders with plastic covers. When multiple binders are used, correlate data into related consistent groupings.
- C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- D. Provide tabbed flyleaf, indexed for each separate product and system, with typed description of product and major component parts of equipment.
- E. Text: Manufacturer's printed data or typewritten data.
- F. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- G. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Design Professional, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by [specification section. For each category, identify names, addresses and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment or product
 - c. Parts list for each component or product
 - d. Operating instructions.
 - e. Maintenance equipment for equipment and systems.

- f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
- 3. Part 3 - Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.

H. Data

- 1. For Each Product or System - List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- 2. Product Data - Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- 3. Drawings - Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawing.

1.5 MANUAL FOR MATERIALS AND FINISHES

- A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: As specified in individual Product Specification sections.

1.6 INSTRUCTION OF PRA PERSONNEL

- A. Before final inspection, instruct PRA's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
- B. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- C. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.7 SUBMITTALS

- A. For equipment, or component parts of equipment put into service during construction and operated by PRA, submit documents within ten days after acceptance.
- B. Submit 2 copies of completed volumes 14 days prior to final inspection. This copy will be reviewed and returned after final observation, with comments. Revise content of all document sets as required prior to final submission.
- C. Submit six (6) sets of revised final volumes in final form prior to or coincidental with Final Application for Payment.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 017836
WARRANTIES

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's procedural requirements for executing, assembling and submitting warranties.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Individual Specification sections requiring warranties or service/maintenance contracts.

1.3 SUBMITTAL REQUIREMENTS

- A. Submit two (2) sets of original signed copies of warranties, bonds, service and maintenance contracts, executed by the respective manufacturers, suppliers, and subcontractors.
- B. Contents - Neatly type, in orderly sequence, the following information for each item.
 - 1. Product or work item.
 - 2. Subcontractor supplier and manufacturers names, addresses, and telephone numbers.
 - 3. Date of beginning and duration time of warranty, bond, or service and maintenance contract.
 - 4. Proper procedure in case of failure.
 - 5. Instances which might affect the validity of warranty or bond.
- C. Bind each set in 8 1/2 inch by 11 inch commercial quality, three-ring binders with plastic covers. Identify each binder with typed or printed title "Warranties" with title of project and location.

1.4 TIME OF SUBMITTALS

- A. For equipment or component parts of equipment placed into service during progress of construction, submit documents within ten (10) days after inspection and acceptance.
- B. Make other submittals within ten (10) days after Date of Substantial Completion, prior to final request for payment.
- C. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 017839
PROJECT RECORD DOCUMENTS

PART 1—GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's administrative and procedural requirements for recording final product and material selections, changes to the Contract, and recording Work concealed by subsequent construction.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 MAINTENANCE OF DOCUMENTS

- A. Maintain at job site, one (1) copy of record documents including Drawings, Specifications, Addenda, Change Orders and other modifications, Shop Drawings, product data and samples.
- B. In addition, maintain one (1) copy of field orders or written instructions, field test records, testing and inspection reports, progress reports, meeting minutes and construction photographs.
- C. Maintain documents in a clean, dry, legible condition and in good order.
- D. Make documents available at all times for inspection.
- E. Review documents at progress meetings.

1.4 RECORDING

- A. Neatly label each document and binder with "Project Record" and project name and location.
- B. Record information concurrently with construction progress.
- C. Do not conceal any work until required information is recorded.
- D. Record Construction Drawings and Shop Drawings: Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 - 1. Note horizontal and vertical locations of concealed elements, referenced to permanent, visible features.
 - 2. Note field changes of dimension and detail.
 - 3. Note details not on original Contract Drawings.
- E. Record Project Manual: Mark to show substantial variations in actual Work performed in comparison with the text of the original. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

- F. Record Product Data: Maintain one copy of each Product Data submittal. Mark documents to show significant variations in actual Work performed in comparison with information submitted. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1.5 SUBMITTALS

- A. Preceding or coincidental with the final pay application, submit the following:
- B. Record Construction Drawings: [One (1) set] of reproducible mylar transparencies showing all notations specified above. Transparencies of the Design Professional's drawings may be used for this purpose upon reimbursement of the printing costs to the Design Professional.
- C. Electronic submission may be permitted in AutoCAD format acceptable to the PRA.
- D. Record Shop Drawings: One (1) copy of any shop drawings.
- E. Record Project Manual: One (1) copy bound in 3 ring binders.
- F. Record Product Data: One (1) copy organized by CSI format bound in 3 ring binders.
- G. If review of Record Documents reveals noncompliance with Contract Documents, Contractor shall correct deficiencies and resubmit.

PART 2—PRODUCTS Not Used

PART 3—EXECUTION Not Used

END OF SECTION



SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

- SUMMARY
- Section Includes:
 - Formwork.
 - Reinforcement.
 - Accessories.
 - Cast-in-place concrete.
 - Finishing.
 - Curing.
- SUBMITTALS
- Shop Drawings: Indicate pertinent dimensions, form materials, and location of bracing and temporary supports.
 - Show form panel layout and form tie layout for surfaces exposed to view in completed construction.
- Indicate reinforcement sizes, spacings, locations, and quantities, bending and cutting schedules, supporting and spacing devices.
- Product Data: Indicate admixtures, anchors, curing and finishing materials.
- Design Data:
 - Submit concrete mix design for each concrete strength.
 - Identify mix ingredients and proportions, including admixtures.
- Test Reports: Submit reports indicating results of quality control inspections and testing.
- QUALITY ASSURANCE
- Perform cast-in-place concrete work in accordance with ACI 301 and ACI 318.
- Code Required Special Inspection and Testing:
 - Reinforced Concrete:
 - Current ICC Reinforced Concrete Special Inspector or Current American Concrete Institute (ACI) Concrete Field Testing Technician – Grade 1 Certification or Pennsylvania Engineer in Training (EIT) with one year related experience

PART 2 PRODUCTS

- FORM MATERIALS AND ACCESSORIES
- Form Materials:
 - At discretion of Contractor.
- Plywood Forms: DOC PS1; exterior grade plywood, oiled or release agent treated and edge sealed fabricated from any of the following, or better:
 - APA B-B High density concrete form overlay, Class 1.
 - APA B-B Medium density overlay.
- Steel Forms: Prefabricated, modular type.
 - Minimum 16 gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
- Form Ties: Removable or snap-off type, galvanized steel or fiberglass construction designed to leave maximum hole size of 1 inch diameter in concrete surface.
- Form Release Agent: Colorless mineral oil which will not stain concrete, absorb moisture, or impair natural bonding or color characteristics of coatings intended for use on concrete.
- VAPOR RETARDERS - UNDER SLABS-ON-GRADE
- Manufacturers:
 - Reef Industries, Inc.; Griffolyn 15.
 - Raven Industries; Vapor Block 15.
 - Stego Industries; Stego Wrap 15.
 - Fortifiber Building Systems Group; Moistop Ultra 15.
 - Or approved equal.
- Vapor Retarder: ASTM E1745, Class A, 0.015 inches thick, plastic sheet membrane.
 - Water Vapor Permeance: ASTM E96/E96M, Procedure B; maximum 0.025 gr/hr•sf•in•Hg.
 - Tensile Strength: ASTM D882; minimum 60 lbs/in
 - Puncture Resistance: ASTM D1709, Method B; minimum 5.3 lbs
 - Sheet Width: 12 feet, minimum.
- Seam Tape: Self-adhering, vapor retarding type as recommended by vapor retarder manufacturer, minimum 4 inches wide.
- Penetration Seal: Mastic, vapor retarding type as recommended by vapor retarder manufacturer.

- REINFORCEMENT MATERIALS
- Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, plain finish.
- Chairs, Bolsters, Bar Supports, and Spacers: Sized and shaped for support of reinforcing.
- Fabricate concrete reinforcing in accordance with ACI 318 and CRSI.
- CONCRETE MATERIALS
- Cement: ASTM C150, Normal-Type I Portland type.
- Fine and Coarse Aggregates: ASTM C33.
- Water: Clean and not detrimental to concrete.
- Pozzolan Admixtures:
 - Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
- Bonding Agent: Latex emulsion.
- COMPOUNDS, HARDENERS AND SEALERS
- Curing Compound: ASTM C1315; clear, waterborne, membrane forming curing and sealing compound.
 - Euclid Chemical Company (The); Super Diamond Clear VOX.
 - L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
 - W.R. Meadows., Inc.; Vocomp-30.
 - Symons Corporation, a Dayton Superior Company; Cure & Seal 30 Plus.
 - Or approved equal.
- CONCRETE MIX
- Mix and deliver concrete in accordance with ASTM C94, Option A.
 - Pozzolan Admixtures: Maximum 45 percent of cement, by weight.
- Provide concrete of the following design strengths. Design mixes to achieve 70 percent of design strengths at 7 days.
 - Compressive strength of 4,000 psi at 28 days.
 - Slump 2 to 4 inches.

PART 3 EXECUTION

- FORMWORK ERECTION - GENERAL
- Erect formwork, shoring and bracing to achieve design requirements.
- Provide bracing to ensure stability of formwork.
- Apply form release agent to formwork in accordance with manufacturer's instructions, prior to placing for accessories and reinforcement.
- Clean forms as erection proceeds, to remove foreign matter.
- WATERPROOFING
- Prepare substrate and install membrane in accordance with manufacturer's installation instructions.
- INSERTS, EMBEDDED COMPONENTS, AND OPENINGS
- Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.
- Install concrete accessories straight, level, and plumb.
- Install waterstops continuous without displacing reinforcement.
- Place formed construction joint device in floor slab pattern pouring sequence.
- Place joint filler at perimeter of floor slab where indicated.
- REINFORCEMENT PLACEMENT
- Place reinforcement, supported and secured against displacement.
- Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.
- PLACING CONCRETE
- Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches and seal watertight. Repair damaged vapor retarder with vapor retarder material, lap over damaged areas minimum 6 inches and seal watertight.
- Separate slabs-on-grade from vertical surfaces with inch thick joint filler, extended from bottom of slab to within 1/4 inch of finished slab surface.
- Place concrete continuously between predetermined expansion, control and construction joints. Do not break or interrupt successive pours such that cold joints occur.

- Place floor slabs in pattern indicated.
- Screed slabs-on-grade level.
- FORM REMOVAL
- Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
 - Do not remove forms until concrete has reached 70 percent of design strength.
- Remove formwork progressively and in accordance with code requirements.

- FINISHING FORMED SURFACES
 - Rough-Formed Finish: As cast concrete with tie holes and defects repaired and patched.
 - Application: Concrete surfaces not exposed to view.
 - Smooth-Formed Finish: As cast concrete with uniform form pattern and minimum number of seams. Repair and patch defects. Leave tie holes exposed and touch-up exposed ends of ties with epoxy repair coating according to ASTM D 3963/D 3963M. Remove fins and other projections.
 - Application: Concrete surfaces exposed to view.

- FLOOR FINISHING
 - Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1.
 - Uniformly spread, screed, and float concrete.
 - Steel trowel floor surfaces.

- CURING
 - Apply curing compound on floor surfaces in accordance with manufacturer's instructions.
 - Immediately after placement, protect concrete from premature drying.
 - Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

- FORMED SURFACES
 - Provide formed concrete surfaces to be left exposed with smooth rubbed finish.

- ERECTION TOLERANCES
- Formed Surface Tolerances: Conform to ACI 117.
- Troweled Floor Surface Tolerances: Conform to ASTM E 1155.
 - Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs- on-grade.
 - Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
- FIELD QUALITY CONTROL
- Perform field inspection and testing for reinforcing steel and concrete in accordance with applicable code, this section and ACI 318.

Verification and Inspection	Continuous	Periodic	Referenced Standard	IBC Reference
1. Inspection of reinforcing steel, including prestressing tendons, and placement		X	ACI 318: 3.5, 7.1-7.7	1913.4
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5b			AWS D1.4 ACI 318: 3.5.2	
4. Verifying use of required design mix		X	ACI 318: Ch 4, 5.2-5.4	1904.2.2, 1913.2, 1913.3
5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete	X		ASTM C172 ASTM C31 ACI 318: 5.6, 5.8	1913.10
7. Inspection for maintenance of specified curing temperature and techniques		X	ACI 318: 5.11-5.13	1913.9
11. Inspect formwork for shape, location and dimensions of the concrete member being formed		X	ACI 318: 6.1.1	

- Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.

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 Health Care Center #10 – Interior and Exterior Improvements
 042200-6
 CONCRETE UNIT MASONRY

- Reinforcement Inspection:
 - Placement Acceptance: Specified and ACI 318 material requirements and specified placement tolerances.
 - Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.

- Concrete Inspections:
 - Continuous Placement Inspection: Inspect for proper installation procedures.
 - Periodic Curing Inspection: Inspect for specified curing temperature and procedures.

- Strength Test Samples:
 - Sampling Procedures: ASTM C172.
 - Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, standard cured field cured.
 - Sample concrete and make one set of three cylinders for every batch delivered

- Field Testing:
 - Slump Test Method: ASTM C143/C143M.
 - Air Content Test Method: ASTM C173/C173M or ASTM C231.
 - Temperature Test Method: ASTM C1064/C1064M.
 - Measure slump and temperature for each compressive strength concrete sample.
 - Measure air content in air entrained concrete for each compressive strength concrete sample.

- Cylinder Compressive Strength Testing:
 - Test Method: ASTM C39/C39M.
 - Test Acceptance: In accordance with ACI 318.
 - Test one cylinder at 7 days.
 - Test two cylinders at 28 days.
 - Retain one cylinder for testing when requested by Design Professional.
 - Dispose remaining cylinders when testing is not required.

- Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

- DEFECTIVE CONCRETE

- Modify or replace concrete not conforming to required lines, details and elevations, as directed by Design Professional.

- END -



SECTION 042200

CONCRETE UNIT MASONRY

PART 1 GENERAL

SUMMARY

- A. Section includes:
 - 1. Concrete masonry units.
 - 2. Reinforcement, anchorage, and accessories.

SUBMITTALS

- A. Product Data: Submit data for masonry units, wall ties, and other accessories.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Test Reports: Submit reports indicating results of quality control inspections and testing.

QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 530 Building Code Requirements for Masonry Structures and ACI 530.1 Specification for Masonry Structures.
- B. Fire Rated Construction: Rating as indicated on Drawings.

QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
- B. Code Required Special Inspection and Testing:
 - 1. Masonry Construction:
 - a. Current ICC Structural Masonry certificate and one year related experience or Pennsylvania EIT with one year related experience.

DELIVERY, STORAGE, AND HANDLING

- A. Accept face brick units on site. Inspect for damage.
- B. Do not accept damaged units on site.

COORDINATION

- A. Coordinate the masonry work with installation of elevator

PART 2 PRODUCTS

STANDARD CONCRETE MASONRY UNITS

- A. Hollow Load Bearing Concrete Masonry Units (CMU): ASTM C90; normal weight.
- B. Solid Load-Bearing Concrete Masonry Units (CMU): ASTM C90; normal weight.
- C. Concrete Masonry Unit Size and Shape: Nominal modular face size of 8 x 16 inches, thickness indicated on Drawings. Provide special units for 90 degree corners, control joints, and other shapes as indicated on Drawings.

REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
 - 1. Hohmann & Barnard Inc.
 - 2. Heckmann Building Products Inc.
 - 3. Wire-Bond.
 - 4. Or approved equal.
- B. Single Wythe Joint Reinforcement: ASTM A951; Truss type; steel; 0.188 inch diameter side rods and 0.148 inch diameter cross ties; hot dip galvanized.
- C. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, plain billet bars, galvanized finish.
- D. Vertical Bar Positioners: ASTM A641/A641M A; formed steel wire, 0.148 inch, diameter mill galvanized finish.

MORTAR AND GROUT

- A. Mortar: ASTM C270, Type S.
- B. Grout: ASTM C476, 3000 psi, pea gravel high slump mix.

FLASHINGS

- A. Thru Wall: Stainless steel; ASTM A240/A240M, Type 304, soft temper;.015 inch thick; smooth finish
- B. Coping Flashing: Stainless steel, soft temper; 0.015 inch thick; smooth finish; formed with ribs 3 inches on center for integral mortar bond.
- C. Lap Sealant: Butyl type as specified in Section 07900.

ACCESSORIES

- A. Manufacturers:
 - 1. Hohmann & Barnard Inc.

2. Heckmann Building Products Inc.
 3. Wire-Bond.
 4. Or approved equal.
- B. Concrete Masonry Preformed Control Joints: Rubber, with corner and tee accessories, fused joints.
1. Hohmann & Barnard Inc.; RS Rubber Standard Rubber Control Joint
 2. Heckmann Building Products Inc.; 352 Series Rubber Control Joint Anchor.
 3. Wire-Bond; Rubber Control Joint.
 4. Or approved equal.
- Cleaning Solution: Acidic, not harmful to masonry work or adjacent materials.
5. Prosoco Inc.; Sure Klean Vana Trol masonry cleaner.
 6. Diedrich Technologies, Inc.; 222 Cast Stone Burnished Masonry Cleaner.
 7. Diedrich Technologies, Inc.; Specialty Masonry Cleaner.
 8. Chargar Corporation; AC-3 Cleaner.
 9. Or approved equal.
- C. Water Repellent: Dry Block manufactured by Grace Construction Products.

PART 3 EXECUTION

EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Verify items provided by other sections of work are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.

INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of Concrete Masonry Units:
 1. Bond: Running.
 2. Coursing: One unit and one mortar joint to equal 8 inches.

3. Mortar Joints: Concave.
- D. Placing And Bonding:
1. Lay solid masonry units in full bed of mortar, with full head joints.
 2. Lay hollow masonry units with face shell bedding on head and bed joints.
 3. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
 4. Remove excess mortar as work progresses.
 5. Interlock intersections and external corners.
 6. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
 7. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
 8. Isolate masonry from vertical structural framing members with a movement joint as indicated.
- E. Joint Reinforcement And Anchorages - Concrete Masonry:
1. Install horizontal joint reinforcement **16 inches** oc.
 2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum **16 inches** both sides of opening.
 3. Place joint reinforcement continuous in first and second joint below top of walls.
 4. Lap joint reinforcement ends minimum **6 inches**.
- F. Masonry Flashings:
1. Install sealant caps above ledge and shelf angles and under flashing and turn down on outside face to form a drip.
 2. Extend flashings horizontally through outer wythe at foundation walls, above ledge or shelf angles and lintels, under parapet caps, under sills, at bottom of walls, and turn down on outside face to form a drip.
 3. Turn flashing up minimum 8 inches and seal to sheathing over steel stud framed backing.
 4. Lap end joints minimum 6 inches and seal watertight.
 5. Turn flashing, fold, and seal at corners, bends, and interruptions. Form sealed end dams at flashing terminations.
 6. Extend flashing minimum 2 inches beyond face of wall for installation verification. Cut flashings flush with face of wall after verification.
 7. Seal joints below sealant caps in accordance with Section 07900.
- G. Lintels:
1. Install 4000 psi pre-cast concrete lintels over openings.
 2. Maintain minimum 8 inches bearing on both sides of opening.
- H. Grouted Components:
1. Reinforce grouted components as indicated on Drawings.
 2. Lap splices minimum 50 bar diameters unless otherwise required by code.
 3. Support and secure reinforcing bars from displacement.
 4. Place and consolidate grout fill without displacing reinforcing.
 5. At bearing locations, fill masonry cores with grout for a minimum **12 inches** both sides of opening.

- I. Reinforced Masonry:
1. Lay masonry units with cores vertically aligned and cavities between wythes clear of mortar and unobstructed.
 2. Place reinforcement bars as indicated.
 3. Lap splices minimum 50 bar diameters unless otherwise required by code.
 4. Support and secure reinforcement from displacement.
 5. Place and consolidate grout fill without displacing reinforcing.
 6. Place grout in accordance with ACI 530.1 Specification for Masonry Structures.
- J. Built-In Work:
1. As work progresses, install items to be built-in the work and furnished by other sections.
 2. Install built-in items plumb and level.
 3. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar.
 4. Do not build in materials subject to deterioration.
- K. Cutting And Fitting:
1. Cut and fit for items penetrating masonry construction. Coordinate with other sections of work to provide correct size, shape, and location.
 2. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

FIELD QUALITY CONTROL

- A. Perform field special inspections and testing for masonry construction in accordance with applicable code, this section, and requirements specified in Section 04065.

Inspection Task	Frequency of Inspection		Reference for Criteria		
	Continuous during task listed	Periodically during task listed	IBC Section	ACI530/ASCE 5/TMS 402	ACI 530.1/ASCE 6/TMS 602
1. From the beginning of masonry construction, the following shall be verified to ensure compliance					
a. Proportions of site prepared mortar, grout		X			Art 2.6A
b. Placement of masonry units and construction of mortar joints		X			Art 3.3B
c. Placement of reinforcement, connectors and anchorages		X		Sec 1.13	Art 3.4, 3.6A
d. Grout space prior to grouting	X				Art 3.2D
e. Placement of grout	X				Art 3.5
2. The inspection shall verify					
a. size and location of structural elements		X			Art 3.3G

Inspection Task	Frequency of Inspection		Reference for Criteria		
	Continuous during task listed	Periodically during task listed	IBC Section	ACI530/ASCE 5/TMS 402	ACI 530.1/ASCE 6/TMS 602
b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction	X			Sec 1.2.2(e), 2.1.4, 3.1.6	
c. Specified size, grade and type of reinforcement		X		Sec 1.13	Art 2.4, 3.4
d. Welding of reinforcing bars	X			Sec 2.1.10.7.2, 3.3.4(b)	
e. Protection of masonry during cold weather (temperature below 40 degrees F) or hot weather (temperature above 90 degrees F)		X	Sec 2104.3, 2104.4		Art 1.8C, 1.8D
3. Preparation of any required grout specimens, mortar specimens, and/or prisms shall be observed	X		Sec 2105.2.2, 2105.3		Art 1.4
4. Compliance with required inspection provisions of the construction documents and the approve submittals shall be verified		X			Art 1.5

B. Concrete Masonry Units: Test each type in accordance with ASTM C140.

CLEANING

- A. Remove excess mortar and mortar smears as work progresses.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

PROTECTION OF FINISHED WORK

- A. Protect exposed external corners subject to damage.

- B. Protect base of walls from mud and mortar splatter.
- C. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- D. Protect tops of masonry work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when work is not in progress.

- END -

SECTION 053000



STRUCTURAL STEEL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Structural shapes.
 - 2. Channels and angles.
 - 3. Fasteners, connectors, and anchors.
 - 4. Grout.

1.2 SUBMITTALS

- A. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.
- B. Testing Agency Qualifications for approval, per specification section 01450 – “Contractor’s Quality Control”
- C. Test Reports: Submit reports indicating results of quality control inspections and testing.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - 1. Structural Steel: AISC 303, AISC 341, and AISC 360.

1.4 QUALIFICATIONS

- A. Fabricator: Company specializing in performing Work of this section with minimum five years documented experience.
- B. Erector: Company specializing in performing Work of this section with minimum five years documented experience.
- C. Welders and Welding Procedures: AWS D1.1 qualified within previous 12 months.
- D. Code Required Special Inspection and Testing:
 - 1. Welding: One of the following.
 - a. Current American Welding Society (AWS) Certified Welding Inspector.
 - b. Current AWS Certified Welding Educator.
 - c. Current AWS Certified Welding Engineer or Current American Welding Society/American Institute of Steel Construction (AWS/AISC) Certified Steel Structure Inspector.
 - 2. Nondestructive Testing of Welds:

- a. Current Nondestructive Testing Level II or III (Magnetic Particle Testing, Liquid Penetrant Testing, Ultrasonic Testing or Radiographic Testing)
 - 1) Level II personnel shall be qualified in accordance with the American Society of Nondestructive Testing (ASNT) document SNT-TC-IA (current edition). Level II certification as determined by a Level III examiner is required for each category.
 - 2) Level III Examiner shall be certified by ASNT unless all level II personnel have a current ASNT Central Certification Program certification. Only then will in-house designation of Level III nondestructive testing personnel be permitted.

PART 2 PRODUCTS

2.1 STRUCTURAL STEEL

- A. Structural W-Shapes: ASTM A992/A992M
- B. Channels and Angles: ASTM A36/A36M.
- C. Structural Plates: ASTM A36/A36M.

2.2 FASTENERS, CONNECTORS, AND ANCHORS

- A. AnchorBolts: ASTM A307.
 - 1. Finish:
 - a. Interior Locations: Unfinished.
 - b. Exterior Locations and Bolts Embedded in Masonry: Hot dipped galvanized.
- B. Nuts: ASTM A563 heavy hex type.
 - 1. Finish:
 - a. For Unfinished Bolts: Unfinished.
 - b. For Galvanized bolts: Hot dipped galvanized.
- C. Washers: ASTM F436; Type 1, circular. Furnish clipped washers where space limitations require.
 - 1. Finish:
 - a. For Unfinished Bolts: Unfinished.
 - b. For Galvanized bolts: Hot dipped galvanized.

2.3 WELDING MATERIALS

- A. Welding Materials: AWS D1.1; type required for materials being welded.
 - 1. Electrodes: ASTM A233, Class E70XX.

2.4 ACCESSORIES

- A. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing minimum compressive strength of 7,000 psi at 28 days.
- B. Shop Primer: SSPC Paint 15, Type 1, red oxide.
- C. Touch-Up Primer: Match shop primer.
 - 1. Interior Anti-Corrosive Paints: Maximum volatile organic compound content in accordance with GC-03.
- D. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20.
 - 1. Interior Anti-Corrosive Paints: Maximum volatile organic compound content in accordance with GC-03.

2.5 FABRICATION

- A. Space shear stud connectors as indicated on Drawings.
- B. Continuously seal joined members by intermittent welds and plastic filler. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.
- D. Develop required camber for members.

2.6 FINISH

- A. Prepare structural component surfaces in accordance with SSPC SP 6.
- B. Shop prime structural steel members. Do not prime surfaces that will be field welded, in contact with concrete, or high strength bolted.
- C. Galvanizing for Fasteners, Connectors, and Anchors:
 - 1. Hot-Dipped Galvanizing: ASTM A153/A153M.
 - 2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

2.7 SOURCE QUALITY CONTROL AND TESTS

- A. Shop test bolted and welded connections as specified for field quality control tests.
- B. When fabricator is approved by authority having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 - 1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify bearing surfaces are at correct elevation.
- B. Verify anchors rods are set in correct locations and arrangements with correct exposure for steel attachment.

3.2 PREPARATION

- A. Furnish templates for installation of anchor rods and embedments in concrete and masonry work.
- B. Prepare existing surfaces to receive welding, per SSPC-SP2 hand tool cleaning, or SSPC-SP3 Power Tool Cleaning.

3.3 ERECTION

- A. Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
- B. Field weld components and shear connectors indicated on Drawings.
- C. Field connect members with threaded fasteners; torque to required resistance tighten to snug tight for bearing type connections.
- D. Do not field cut or alter structural members without approval of Design Professional.

3.4 GROUT INSTALLATION

- A. Shim bearing plates and equipment supports to proper elevation, snug tighten anchor bolts.
- B. Fill void under bearing surface with grout. Install and pack grout to remove air pockets.
- C. Moist cure grout.
- D. Remove forms after grout is set. Trim grout edges to form smooth surface, splayed 45 degrees.
- E. Tighten anchor bolts after grout has cured for a minimum of 3 days.

3.5 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset from Alignment: 1/4 inch.

3.6 FIELD QUALITY CONTROL

- A. Perform field special inspections and testing for in accordance with applicable code and this section.

Verification and Inspection	Continuous	Periodic	Referenced Standard	IBC Reference
1. Material verification of high-strength bolts, nuts and washers				
a. Identification markings to conform to ASTM standards specified in the approved construction documents		X	Applicable ASTM material specifications; AISC 3609, Section A3.3	
b. Manufacturer's certificate of compliance required		X		
2. Inspection of high-strength bolting				
a. Bearing type connections		X	ASIC 360, Section M2.5	1704.3.3
b. Slip-critical connections		X		
3. Material verification of structural steel				
a. Identification markings to conform to ASTM standards specified in the approved construction documents		X	ASTM A6 or ASTM A568	1708.4
b. Manufacturer's certified mill test reports			ASTM A6 or ASTM A568	
4. Material verification of weld filler materials				
a. Identification markings to conform to AWS specification in the approved construction documents			AISC 360, Section A3.5	
b. Manufacturer's certificate of compliance required				
5. Inspection of welding				
a. Structural steel				
1) Complete and partial penetration groove welds	X		AWS D1.1	1704.3.1
2) Multipass fillet welds	X			
3) Single pass fillet welds > 5/16 inch	X			
4) Single pass fillet welds ≤ 5/16 inch		X		
5) Floor and roof deck welds		X	AWS D1.3	
b. Reinforcing steel - Not applicable				
6. Inspection of steel frame joint details for compliance with approved construction documents		X		1704.3.2
a. Details such as bracing and stiffening				
b. Member locations				
c. Application of joint details at each connection				

- B. Bolted Connections: Inspect in accordance with AISC 303 specifications.
 - 1. Visually inspect all bolted connections.

- C. Welding: Inspect welds in accordance with AWS D1.1.
 - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 - 2. Visually inspect all welds.

- D. Correct defective bolted connections and welds.

- END -



SECTION 053100

STEEL DECKING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Steel roof deck.
 - 2. Steel deck accessories.
 - 3. Bearing plates and angles.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate decking plan, support locations, projections, openings and reinforcement, pertinent details, and accessories.
- B. Product Data: Submit deck profile characteristics and dimensions, structural properties, and finishes.
- C. Design Data: Submit structural calculations for loadings and stresses of steel deck, framing and connections.
- D. Manufacturer's Certificates: Certify that Products meet or exceed specified requirements.
- E. Welders Certificates: Certify welders AWS qualification within the previous 12 months.
- F. Test Reports: Submit reports indicating results of quality control inspections and testing.

1.3 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.
 - 1. Manufacturing Location: Within 500 miles of Project site.
- B. Installer: Company specializing in performing the work of this Section with minimum five years documented experience.
- C. Code Required Special Inspection and Testing:
 - 1. Welding: One of the following.
 - a. Current American Welding Society (AWS) Certified Welding Inspector.
 - b. Current AWS Certified Welding Educator.

- c. Current AWS Certified Welding Engineer or Current American Welding Society/American Institute of Steel Construction (AWS/AISC) Certified Steel Structure Inspector.
2. Nondestructive Testing of Welds:
- a. Current Nondestructive Testing Level II or III (Magnetic Particle Testing, Liquid Penetrate Testing, Ultrasonic Testing or Radiographic Testing)
 - 1) Level II personnel shall be qualified in accordance with the American Society of Nondestructive Testing (ASNT) document SNT-TC-IA (current edition). Level II certification as determined by a Level III examiner is required for each category.
 - 2) Level III Examiner shall be certified by ASNT unless all level II personnel have a current ASNT Central Certification Program certification. Only then will in-house designation of Level III nondestructive testing personnel be permitted.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Cut plastic wrap to encourage ventilation.
- B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.1 STEEL DECK

- A. Manufacturers:
 - 1. Butler Manufacturing Co.
 - 2. New Columbia Joist Co.
 - 3. Vulcraft Steel Joist.
 - 4. United Steel Deck.
 - 5. Vulcraft Steel Deck.
 - 6. Wheeling Corrugating Co.
 - 7. Or approved equal.
- B. Galvanized Steel: ASTM A653/A653M, structural steel sheet, G60 zinc coating.
- C. Pre-coated Galvanized Steel: ASTM A653/A653M, structural steel sheet, G60 zinc coating, finished with manufacturer's standard shop primer, as selected.
- D. Bearing Plates: ASTM A36/A36M steel, unfinished.
- E. Welding Materials: AWS D1.1 and AWS D1.3 to suit materials being welded.
- F. Galvanizing Repair Paint: SSPC-Paint 20.
- G. Touch-Up Primer: Match shop primer.

2.2 ROOF DECK FABRICATION

- A. Metal Deck: Configured as follows:
 - 1. Sheet Metal:
 - a. Concealed Locations: Galvanized sheet steel.
 - 2. Span Design: Single.
 - 3. Minimum Metal Thickness Excluding Finish: 20 gage.
 - 4. Nominal Height: 1-1/2 inch, fluted profile.
 - 5. Formed Sheet Width: 32 inch.
 - 6. Side Joints: Lapped.
 - 7. Flute Sides: Plain vertical face.

2.3 DECK ACCESSORY FABRICATION

- A. Deck Accessories: Metal closure strips, wet concrete stops, cover plates, 22 gage galvanized sheet steel; of profile and size as indicated.
- B. Fasteners: Stainless steel, self tapping.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify field conditions are acceptable and are ready to receive work.

3.2 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual.
- B. Bear decking on steel supports with 1-1/2 inch minimum bearing. Align and level.
- C. Fasten deck to steel support members at ends and intermediate supports with 5/8 inch puddle welds through weld washers or mechanical fasteners at 12 inches on center maximum, at bearing ends and parallel with deck flute and at every other transverse flute.
- D. Perform welding procedures in accordance with AWS D1.1.
- E. Mechanically fasten or weld side laps at 24 inches on center maximum.
- F. Reinforce steel deck openings from 6 to 18 inches in size with 1-3/4 x 1-3/4 x 1/4 inch steel angles. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld or mechanically attach to deck at each flute.
- G. Install 6 inch minimum wide sheet steel cover plates, of same thickness as decking, where deck changes direction. Fusion weld or mechanically attach 12 inches on center maximum.

- H. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.
- I. Immediately after welding deck and other metal components in position, coat welds, weld blooms, burned areas, and damaged surface coating, with touch-up prime paint.

3.3 FIELD QUALITY CONTROL

- A. Perform field special inspections and testing for in accordance with applicable code and this section.

Verification and Inspection	Continuous	Periodic	Referenced Standard	IBC Reference
4. Material verification of weld filler materials				
a. Identification markings to conform to AWS specification in the approved construction documents			AISC 360, Section A3.5	
b. Manufacturer's certificate of compliance required				
5. Inspection of welding				
a. Structural steel				
5) Floor and roof deck welds		X	AWS D1.3	

- B. Welding: Inspect welds in accordance with AWS D1.1.
 - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
 - 2. Visually inspect all welds.
- C. Correct defective welds.

- END -

SECTION 055000



METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
2. Exposed aluminum supports for interior skylights.
3. Elevator machine beams and hoist beams.
4. Steel shapes for supporting elevator door sills.
5. Cants in elevator shafts made from steel sheet.
6. Metal ladders.
7. Elevator pit sump covers.
8. Loose bearing and leveling plates for applications where they are not specified in other Sections.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. 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.

1.4 ACTION SUBMITTALS

- A. Product Data: For paint products and grout.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

- C. Delegated-Design Submittal: For ladders, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design ladders.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

- D. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4; of 1-5/8 by 1-5/8 inches (41 by 41 mm) size unless otherwise indicated; fabricated from one of the following unless otherwise indicated:
 - 1. Galvanized steel, ASTM A 653/A 653M, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; 0.108-inch (2.8-mm) nominal thickness.
 - 2. Cold-rolled steel, ASTM A 1008/A 1008M, structural steel, Grade 33 (Grade 230); 0.0966-inch (2.5-mm) minimum thickness; hot-dip galvanized after fabrication.
- E. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- F. Aluminum Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.
- G. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 1 (A1).
- D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- E. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
- F. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

- G. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
- H. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Division 09 painting and coating Sections.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply 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. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.
- K. Provide cants in elevator shafts to provide 75-degree slope on top of projections and setbacks in the shaft that exceed 4 inches (100 mm), unless required slope is provided by another material. Fabricate cants from steel sheet to comply with the Elevator Code.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.

2.7 METAL LADDERS

- A. General: For elevator pit ladders, comply with ASME A17.1/CSA B44.
- B. Steel Ladders:
 - 1. Space siderails 16 inches (406 mm) apart unless otherwise indicated.
 - 2. Siderails: Continuous, 3/8-by-2-1/2-inch (9.5-by-64-mm) steel flat bars, with eased edges.
 - 3. Rungs: 3/4-inch- (19-mm-) diameter steel bars.
 - 4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
 - 5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
 - 6. Support each ladder at top and bottom and not more than 60 inches (1500 mm) o.c. with welded or bolted steel brackets.
 - 7. Galvanize ladders, including brackets.

2.8 ELEVATOR PIT SUMP COVERS

- A. Fabricate from Welded steel bar grating with openings not more than 3/4 inch (19 mm) in least dimension.
- B. Provide steel angle supports.
- C. Galvanize elevator sump pit covers and supports.

2.9 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize plates.

2.10 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.11 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.12 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with primers specified in Section 099000 "Painting and Coating" unless indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.13 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 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. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION



MISCELLANEOUS ROUGH CARPENTRY

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Dimension lumber framing and furring for exterior fiber-cement wall panel assemblies.
2. Wood blocking and nailers.
3. Plywood backing panels.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
1. NeLMA: Northeastern Lumber Manufacturers' Association.
 2. NHLA: National Hardwood Lumber Association.
 3. NLGA: National Lumber Grades Authority.
 4. SPIB: The Southern Pine Inspection Bureau.
 5. WCLIB: West Coast Lumber Inspection Bureau.
 6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
 - 1. Preservative-treated wood.
 - 2. Power-driven fasteners.
 - 3. Powder-actuated fasteners.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction, Use Category UC3b for fiber-cement panel exterior cladding assemblies.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

- D. Application: Treat items indicated on Drawings, and the following:
1. Wood framing and furring for exterior fiber-cement wall panel assemblies.
 2. Wood nailers, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 3. Wood sleepers, blocking, and similar concealed members in contact with masonry or concrete.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
1. Use treatment that does not promote corrosion of metal fasteners.
 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
- E. Application: Treat items indicated on Drawings, and the following:
1. Plywood backing panels.

2.4 DIMENSION LUMBER FRAMING

- A. Framing And Furring For Exterior Wall Panels: No. 2 grade and any of the following species:
1. Hem-fir (north); NLGA.
 2. Southern pine; SPIB.
 3. Douglas fir-larch; WCLIB or WWPA.
 4. Mixed southern pine; SPIB.
 5. Spruce-pine-fir; NLGA.
 6. Douglas fir-south; WWPA.
 7. Hem-fir; WCLIB or WWPA.
 8. Douglas fir-larch (north); NLGA.
 9. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including blocking and nailers.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine; SPIB.
 - 3. Spruce-pine-fir; NLGA.
 - 4. Hem-fir; WCLIB or WWPA.
 - 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
 - 6. Western woods; WCLIB or WWPA.
 - 7. Northern species; NLGA.
 - 8. Eastern softwoods; NeLMA.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.6 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where carpentry is pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Metal Framing: ASTM C 1002 for non-load-bearing steel framing, ASTM C 954 for cold-formed metal framing; length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

- H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

- 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2.8 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- F. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- G. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
- H. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

END OF SECTION



ARCHITECTURAL CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Architectural casework and other custom-fabricated woodwork, including the following:
 - a. Check-in desk assemblies of wood framing and medium-density fiberboard construction with solid-surface-material cladding and plastic-laminate cladding.
 - b. Plastic-laminate-faced cabinets.
 - c. Solid-surface-material countertops for architectural cabinets.
 - d. Solid-surface-material work surfaces and transaction tops for check-in desk assemblies.
2. Wood furring, blocking, shims, and hanging strips for installing architectural casework unless concealed within other construction before casework installation.
3. Shop finishing of architectural casework.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing casework and concealed within other construction before casework installation.
2. Section 064600 "Wood Trim."
3. Division 22 Sections for sinks and plumbing fittings.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site, scheduled to coincide with regular progress meeting.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including panel products, high-pressure decorative laminate, adhesive for bonding plastic laminate, cabinet hardware and accessories, and finishing materials and processes.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural casework.
4. For countertops, show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
 - a. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, electrical switches and outlets, and other items installed in countertops.

C. Samples for Initial Selection:

1. Shop-applied opaque finishes.
2. Plastic laminates.
3. Countertop materials.
4. PVC edge material.
5. Thermoset decorative panels.

D. Samples for Verification:

1. Lumber and panel products with shop-applied opaque finish, 5 inches (125 mm) wide by 12 inches (300 mm) long for lumber and 12 by 12 inches (300 by 300 mm) for panels, for each finish system and color, with one-half of exposed surface finished.
2. Plastic laminates, 12 by 12 inches (300 by 300 mm), for each type, color, pattern, and surface finish, with one sample applied to core material and specified edge material applied to one edge.
3. Countertop material, 6 inches (150 mm) square.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and fabricator.
- B. Product Certificates: For each type of product.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Fabrication Shop Observation: Before fabricating and installing architectural woodwork, build one small-sized wall cabinet and portion of check-in desk assembly in its entirety to demonstrate qualities of materials and execution. Use materials and fabrication indicated for the completed Work.
 1. Notify Architect seven days in advance of dates and times when casework unit will be fabricated.
 2. Demonstrate the proposed range of aesthetic effects and workmanship.
 3. Obtain Architect's approval of casework unit before proceeding with remaining architectural woodwork fabrication.
 4. Approved casework unit may become part of the completed Work if in acceptable condition at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver casework until painting and similar operations that could damage woodwork have been completed in installation areas. If casework must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where casework is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.
 - 2. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural casework can be supported and installed as indicated.
- B. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CASEWORK, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural casework and countertops indicated for construction, finishes, installation, and other requirements.
 - 1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

2.2 PLASTIC-LAMINATE-FACED CASEWORK

- A. Grade: Custom.
- B. Type of Construction: Frameless.

- C. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.
- D. Laminate Cladding for Exposed Surfaces:
 - 1. Horizontal Surfaces: Grade HGS.
 - 2. Vertical Surfaces: Grade HGS.
 - 3. Edges: PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.
 - 4. Colors, Patterns, and Finishes: As selected by Architect from manufacturer's full range.
- E. Materials for Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies and Shelves: Thermoset decorative panels.
 - 2. Surfaces of Shelves: High-pressure decorative laminate, NEMA LD 3, Grade VGS or CLS.
 - a. Edges of Plastic-Laminate Shelves: PVC T-mold matching laminate in color, pattern, and finish; or PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.
 - b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS or Grade CLS.
 - 3. Drawer Sides and Backs: Solid-hardwood lumber.
 - 4. Drawer Bottoms: Hardwood plywood.
- F. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.
- G. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.

2.3 SOLID-SURFACE-MATERIAL CLADDING AND COUNTERTOPS

- A. Grade: Custom.
- B. Solid-Surface-Material Type: Provide Standard Type or Veneer Type made from material complying with requirements for Standard Type, as indicated.
 - 1. Colors and Patterns: As selected by Architect from manufacturer's full range.
- C. Vertical Cladding: 1/4-inch (6.4-mm) thick, solid surface material laminated to 3/4-inch (19-mm) thick medium-density fiberboard.
- D. Tops: 1/2-inch- (12.7-mm-) thick, solid surface material with front edge built up with same material.

- E. Fabrication: Fabricate tops in one piece with shop-applied edges unless otherwise indicated. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

2.4 CASEWORK MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Medium-Density Fiberboard: ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
 - 2. Softwood Plywood: DOC PS 1.
 - a. Plywood for Countertop Substrates: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.
 - 3. Thermoset Decorative Panels (Melamine): Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.
- C. High-Pressure Decorative Laminate: NEMA LD 3, Grade as indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Formica Corporation.
 - b. Panolam Industries International, Inc.; Nevamar.
 - c. Wilsonart International; Div. of Premark International, Inc.
- D. Solid Surface Material: Homogeneous solid sheets of filled plastic resin complying with ANSI SS1.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. E. I. du Pont de Nemours and Company.
 - b. Meganite Inc.
 - c. Wilsonart International.

2.5 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural casework.

- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening, self-closing.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
- D. Wire Pulls: Back mounted, solid metal, 5 inches (127 mm) long, 2-1/2 inches (63.5 mm) deep, and 5/16 inch (8 mm) in diameter.
- E. Shelf Rests: BHMA A156.9, B04013; metal.
- F. Drawer Slides: BHMA A156.9.
 - 1. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-overtravel-extension type; zinc-plated-steel ball-bearing slides.
 - 2. For drawers not more than 6 inches (150 mm) high and not more than 24 inches (600 mm) wide, provide Grade 1HD-100.
 - 3. For drawers more than 6 inches (150 mm) high or more than 24 inches (600 mm) wide, provide Grade 1HD-200.
 - 4. For computer keyboard shelves, provide Grade 1HD-100.
 - 5. For trash bins not more than 20 inches (500 mm) high and 16 inches (400 mm) wide, provide Grade 1HD-200.
- G. Door Locks: BHMA A156.11, E07121.
- H. Drawer Locks: BHMA A156.11, E07041.
- I. Provide locks for cabinet doors and drawers in locations indicated.
- J. Door and Drawer Silencers: BHMA A156.16, L03011.
- K. Grommets for Cable Passage through Countertops: 3-inch (76-mm) OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
- L. Support Brackets for Check-In Desk Tops: TIG-welded extruded-aluminum support brackets, spaced no more than 48 inches o.c. and complying with the following:
 - 1. Basis-of-Design Product: Rakks (rakks.com); Model EH-1818.
 - 2. Profile and Size: 2-by-2-inch T-shape, 1/4-inch thick, 18 inches high by 18 inches deep.
 - 3. Capacity: 450 lbs. per bracket.
 - 4. Finish: Black powder coat.
 - 5. Supports and Anchorage: Coordinate concealed blocking and supports in wall construction to support counter loads.
- M. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Bright Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel base.
- N. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.6 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- C. Adhesives: Do not use adhesives that contain urea formaldehyde.
- D. Adhesive for Bonding Plastic Laminate: Contact cement.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.
- E. VOC Limits for Installation Adhesives and Sealants: Use products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Wood Glues: 30 g/L.
 - 2. Multipurpose Construction Adhesives: 70 g/L.
 - 3. Structural Wood Member Adhesive: 140 g/L.
 - 4. Architectural Sealants: 250 g/L.

2.7 FABRICATION

- A. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of Casework: 1/16 inch (1.5 mm) unless otherwise indicated.
- B. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

2.8 SHOP FINISHING

- A. General: Finish architectural casework at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural casework, as applicable to each unit of work.
 - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of casework.
- C. Opaque Finish:
 - 1. Grade: Custom.
 - 2. Finish: One of the following:
 - a. System - 4, water-based latex acrylic.
 - b. System - 5, conversion varnish.
 - c. System - 7, catalyzed vinyl.
 - d. System - 10, water-based UV curable.
 - 3. Color: As selected by Architect from manufacturer's full range.
 - 4. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition casework to average prevailing humidity conditions in installation areas.
- B. Before installing casework, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install casework to comply with same grade as item to be installed.
- B. Assemble casework and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install casework level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- D. Scribe and cut casework to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor casework to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.

1. For shop finished items use filler matching finish of items being installed.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 2. Maintain veneer sequence matching of cabinets with transparent finish.
 3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips; or No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
1. For solid-surface-material countertops, pre-drill holes for screws as recommended by manufacturer.
 2. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 3. For plastic-laminate countertops, secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and to walls with adhesive.
 4. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.
- H. Field Jointing Plastic-Laminate Countertops: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer.
Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- I. Solid-Surface-Material Countertops: Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- J. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective casework, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean casework on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION



WOOD TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior standing and running trim.
2. Shop priming

B. Related Requirements:

1. Section 099000 "Painting and Coatings" for field finishing wood trim.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- A. Samples for Verification: Lumber for transparent finish, not less than 5 inches (125 mm) wide by 24 inches (600 mm) long, for each species and cut, finished on one side and one edge.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver wood trim until operations that could damage wood trim have been completed in installation areas. If wood trim must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.6 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood trim can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 WOOD TRIM, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of wood trim indicated for construction, finishes, installation, and other requirements.
 - 1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

2.2 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

- A. Grade: Custom.
- B. Wood Species and Cut: Match species and cut indicated for other types of transparent-finished architectural woodwork located in same area of building unless otherwise indicated.

2.3 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

- A. Grade: Custom.
- B. Wood Species: Any closed-grain hardwood.

2.4 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.
 - 1. Wood Moisture Content for Interior Materials: 5 to 10 percent.

2.5 MISCELLANEOUS MATERIALS

- A. Interior Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Provide self-drilling screws for metal-framing supports, as recommended by metal-framing manufacturer.
- C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- D. Adhesives: Do not use adhesives that contain urea formaldehyde.

2.6 FABRICATION

- A. Fabricate wood trim to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Edges of Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
 2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
- B. Backout or groove backs of flat trim members and kerf backs of other wide, flat members except for members with ends exposed in finished work.

2.7 SHOP PRIMING

- A. Interior Wood Trim for Opaque Finish: Shop prime with one coat of wood primer specified in Section 099000 "Painting and Coating."
- B. Interior Wood Trim for Transparent Finish: Shop seal with stain and first coat of finish as specified in Section 099000 "Painting and Coating."
- C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood trim, as applicable to each unit of work.
 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood trim. Apply two coats to surfaces installed in contact with concrete or masonry and to end-grain surfaces.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition wood trim to average prevailing humidity conditions in installation areas.
- B. Before installing architectural wood trim, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install wood trim to comply with same grade as item to be installed.
- B. Assemble wood trim and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install wood trim level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- D. Scribe and cut wood trim to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor wood trim to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 1. For shop-finished items, use filler matching finish of items being installed.

- F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 96 inches (2400 mm) long except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.
 - 1. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).
- G. Touch up finishing work specified in this Section after installation of wood trim. Fill nail holes with matching filler where exposed.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective wood trim, where possible, to eliminate functional and visual defects; where not possible to repair, replace wood trim. Adjust joinery for uniform appearance.
- B. Clean wood trim on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION



SECTION 066500

EXTERIOR SYNTHETIC (POLY-ASH) TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exterior synthetic (poly-ash) trim.

1.2 RELATED REQUIREMENTS

- A. Section 099113 – Exterior Painting

1.3 REFERENCE STANDARDS

- A. ASTM C 1185 – Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.
- B. ASTM D 570 – Standard Test Method for Water Absorption of Plastics.
- C. ASTM D 1761 – Standard Test Methods for Mechanical Fasteners in Wood.
- D. ASTM D 6341 – Standard Test Method for Determination of the Linear Coefficient of Thermal Expansion of Plastic Lumber and Plastic Lumber Shapes Between -30 and 140°F (-34.4 and 60°C).
- E. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. AWPA E1 – Standard Method for Laboratory Evaluation to Determine Resistance to Subterranean Termites.
- G. AWPA E10 – Standard Method of Testing Wood Preservatives by Laboratory Soil-Block Cultures.

1.4 SUBMITTALS

- A. Comply with Submittal Procedures as shown in Project Manual.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Samples: Submit manufacturer's sample of poly-ash siding.
- D. Sample Size: Submit manufacturer's sample of exterior synthetic trim, minimum 1 inch by 4 inches by 8 inches long.
- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- F. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Storage and Handling Requirements:
1. Store and handle materials in accordance with manufacturer's instructions.
 2. Keep materials in protective covering until installation.
 3. Store materials in clean, dry area.
 4. Store exterior synthetic trim on flat, level surface.
 5. Keep exterior synthetic trim covered and free of dirt and debris.
 6. Protect materials and finish during storage, handling, and installation to prevent damage.

1.5 WARRANTY

- A. Warranty Period for Exterior Synthetic Trim: 20-year limited warranty.
1. No decay due to rot.
 2. No excess swelling from moisture.
 3. Resist termite damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Manufacturer: Boral Composites Inc., 200 Mansell Court East, Suite 305, Roswell, Georgia 30076. Toll Free 888-926-7259.
Website www.boraltruexterior.com; E- mail info@truexterior.com.

2.2 EXTERIOR SYNTHETIC TRIM

- A. Exterior Synthetic (Poly-ash) Trim: Boral TruExterior® Trim.
- B. Composition:
1. Post-Industrial Recycled Content: Minimum 70 percent, by weight.
 2. Post-Consumer Recycled Content: Minimum 2 percent, by weight
 3. Pigments and dyes.
- C. Physical Properties:
1. Density, ASTM C 1185: 40 to 50 pcf.
 2. Water Absorption, ASTM D 570: Less than 1.5 percent.
 3. Fungi Rot, AWWA E10:
 4. White Rot: Negligible loss.
 5. Brown Rot: Negligible loss.
 6. Termite Resistance, AWWA E1: Greater than 9.0, with 10 being impervious.
- D. Mechanical Properties:
1. Flexural Strength, ASTM C 1185: Greater than 1,600 psi.
 2. Nail Withdrawal, ASTM D 1761: Greater than 40 lbf/in.
- E. Thermal Properties:
1. Coefficient of Linear Expansion, ASTM D 6341, Typical: 1.40E-05 in/in/degree F, tested at minus 30 to 140 degrees F.
 2. Flame Spread, ASTM E 84: Between 25 and 29
 3. Smoke Developed, ASTM E 84: Less than 450.

3.2 INSTALLATION

- A. Install exterior synthetic trim in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Do not install exterior synthetic trim in structural or load-bearing applications.
- C. Install exterior synthetic trim plumb, level, and square.
- D. Install exterior synthetic trim with flush, tight joints.
- E. Install Fasteners:
 - 1. Maximum of 24 inches on center.
 - 2. Within 2 inches of end of boards.
- F. Fill nail and screw holes with acrylic caulk, wood filler, or auto body filler.
- G. Repair minor damages to exterior synthetic trim in accordance with manufacturer's instructions and as approved by Architect.
- H. Remove and replace damaged exterior synthetic trim that cannot be successfully repaired as determined by Architect.
- I. Painting:
 - 1. Apply top coat to exterior synthetic trim over factory-applied primer.
 - a. Within 60 days of installing trim.
 - b. As specified in Section 099113.

3.3 PROTECTION

- A. Protect installed exterior synthetic trim to ensure that, except for normal weathering, trim will be without damage or deterioration at time of Substantial Completion.

END OF SECTION



SECTION 070152

ROOF PENETRATIONS AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cutting through roofing systems for new roof penetrations.
2. Patching roofing systems at new penetrations and at areas affected by alterations to existing construction.
3. Flashing at new roof penetrations.
4. Compliance with existing roofing system warranty to maintain warranty protection.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking and nailers.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- ###### A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- ###### A. Product Data: For each type of product proposed for use in roof penetration and patching work.

1.4 INFORMATIONAL SUBMITTALS

- ###### A. Qualification Data: For Installer including certificate that Installer is approved by warrantor of existing roofing system.

1.5 CLOSEOUT SUBMITTALS

- ###### A. Maintenance Data: For roofing materials to include in maintenance manuals.
- ###### B. Warranty: Written confirmation of continuing warranty coverage from warrantor of existing roofing system.

1.6 QUALITY ASSURANCE

- ###### A. Installer Qualifications: Engage installer of existing roofing system, or another Installer approved by warrantor of existing roofing system, to perform roof patching and repair work and to ensure that existing warranty continues in force.
- ###### B. Roof Penetration and Patching Conference: Conduct conference at Project site.
1. Meet with Owner, Architect, roofing system manufacturer's representative, and installers whose work interfaces with or affects roof patching and repair work including installers of roof-mounted equipment.

2. Review methods and procedures related to roof penetrations and patching including, but not limited to, the following:
 - a. Roofing preparation, including roofing system manufacturer's written instructions.
 - b. Temporary protection requirements for existing roofing system, and to ensure that water does not enter existing roofing system or building during roof penetration and patching work.
 - c. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - d. Structural loading limitations of roof structure during roofing work.
 - e. Flashings, roofing details, drainage, penetrations, and condition of other construction that will affect roofing work.
 - f. Governing regulations and requirements for insurance and certificates if applicable.
 - g. Existing conditions that may require notification of Architect before proceeding.

1.7 PROJECT CONDITIONS

- A. Owner will occupy portions of building. Conduct roof penetration and patching work so Owner's operations will not be disrupted. Provide Owner with not less than 3 days' notice of activities that may affect Owner's operations.
- B. Protect building, adjacent walkways, site improvements, exterior plantings and landscaping from damage or soiling from roofing operations.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- D. Weather Limitations: Proceed with roof penetration and patching work only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1.8 WARRANTY

- A. Existing Warranty: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing system warranty. Notify warrantor before proceeding.
 1. Notify warrantor of existing roofing system on completion of roof penetration and patching work, and obtain documentation verifying that existing roofing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Use materials matching existing roofing system materials, or recommended by roofing system manufacturer for intended use and compatible with components of existing roofing system, unless otherwise indicated.
- B. Roofing Boards: Provide substrate boards, thermal barriers, protection boards, cover boards, insulation boards, and other materials (if any) to match existing.

- C. Wood Members: Preservative treated wood complying with requirements specified in Section 061053 "Miscellaneous Rough Carpentry."
- D. Stainless-Steel Sheet Flashing: ASTM A 240/A 240M, Type 304, dead soft, fully annealed; 2D (dull, cold rolled) finish.
 - 1. Stainless Steel Sheet Thickness: Not less than 0.019 inch (0.48 mm) thick.
- E. Sheet Metal Accessories: Comply with SMACNA and NRCA recommendations for roofing types and applications.
 - 1. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
 - 2. Solder for Stainless Steel: ASTM B 32, Grade Sn60 or Grade Sn96, with acid flux of type recommended by stainless-steel sheet manufacturer.
- F. Fasteners: Galvanized steel, fluoropolymer-coated steel, or nonferrous metal screws. Size, length, and type recommended by manufacturer as suitable for material to be fastened, substrate, and that will comply with requirements of governing authorities and listing agencies.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect existing roofing conditions and report unsatisfactory conditions in writing. Beginning work constitutes acceptance of substrate and conditions.

3.2 PREPARATION

- A. Protect existing roofing adjacent to areas of roof penetration and patching work, as recommended by manufacturer of existing roofing system.
 - 1. Limit traffic and material storage to areas of existing roofing that have been protected.
 - 2. Maintain temporary protection and leave in place until roof penetration and patching work has been completed. Remove temporary protection on completion of roof penetration and patching work.
- B. During roof penetration and patching work, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- C. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 1. If roof drains are temporarily blocked or unserviceable due to roof penetration and patching work, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing roofing system components that are to remain.
- D. Metal Protection: Where dissimilar metals contact each other, or where metal contacts treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

3.3 INSTALLATION

- A. Existing Roofing Under Warranty: Do not begin roof penetration and patching work without first obtaining written authorization from manufacturer of existing roofing.
 1. Perform roof penetration and patching work only in presence of manufacturer's representative, where required to maintain warranty coverage.
- B. Coordinate installation with other trades, including carpentry, flashing and penetrating work.
- C. Comply with NRCA Roofing and Waterproofing Manual and manufacturer's installation instructions.
- D. Clean, prime and prepare substrate.
- E. Coordinate installing roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight. Provide cut offs at end of each day's work.
- F. Install membrane with ply sheets shingled uniformly to achieve required number of membrane plies throughout. Shingle in proper direction to shed water on each area of roofing.
- G. Nailing: Comply with governing regulations, insurance requirements, manufacturer recommendations, and recognized industry standards.
- H. Flashing: Install sheet metal flashing to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
 1. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
 2. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
- I. Restore or replace damaged components. Protect work from damage.

3.4 DISPOSAL

- A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION



SECTION 072100
THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Foam-plastic board insulation.
2. Mineral-wool board insulation.
3. Glass-fiber blanket insulation.
4. Sound attenuation blanket insulation.

B. Related Requirements:

1. Section 075216 "SBS-Modified Bituminous Membrane Roofing" for insulation specified as part of roofing construction.
2. Section 092216 "Non-Structural Metal Framing" for Z-furring installed with board insulation.
3. Section 092900 "Gypsum Board" for installation in framed assemblies of insulation specified by referencing this Section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
- B. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

- A. Foil-Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type I, Class 1 or Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

2.2 MINERAL-WOOL BOARD INSULATION

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Isolatek International.
 - 2. Owens Corning.
 - 3. Roxul Inc.
 - 4. Thermafiber.
- B. Unfaced, Mineral-Wool Board Insulation: ASTM C 612; with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 1. Nominal density of 6 lb/cu. ft. (96 kg/cu. m), Type II, thermal resistivity of 4.16 deg F x h x sq. ft./Btu x in. at 75 deg F (28.8 K x m/W at 24 deg C).

2.3 FORMALDEHYDE-FREE GLASS-FIBER BLANKET INSULATION

- A. Glass-Fiber Insulation with Vapor Retarder Facing: ASTM C 665, Type II, Class A, Category 1; encapsulated in plastic facing that serves as a vapor retarder.
 - 1. Basis-of-Design Product: Johns Manville; ComfortTherm, JM Formaldehyde-free™.
 - 2. Fire-Resistance-Ratings: Flame-spread index of 25 or less and Smoke Developed of 50 or less; when tested according to ASTM E 84.

2.4 SOUND ATTENUATION BLANKET INSULATION

- A. Formaldehyde-Free Glass-Fiber Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining resilient glass fibers with acrylic thermosetting binder; designed for friction-fit installation without fastening.
 - 1. Basis-of-Design Product: Johns Manville; Formaldehyde-free™ Sound Control Batts.
 - 2. Fire-Resistance-Ratings: Flame-spread index of 25 or less and Smoke Developed of 50 or less; when tested according to ASTM E 84.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Glass-Fiber Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
 - 5. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
 - a. Exterior Walls: Set units with facing placed toward interior of construction.

C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.4 PROTECTION

A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION



FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Fluid-applied, vapor-retarding membrane air barriers.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site. Schedule concurrently with pre-installation conference for fiber-cement wall panel systems.
 - 1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.
- B. Shop Drawings: For air-barrier assemblies.
 - 1. Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and ties with adjoining construction.
 - 2. Include details of interfaces with other materials that form part of air barrier.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

- B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.
 - 1. Protect substrates from environmental conditions that affect air-barrier performance.
 - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa), when tested according to ASTM E 283, ASTM E 783, or ASTM E 2357.

2.3 VAPOR-RETARDING MEMBRANE AIR BARRIER

- A. Fluid-Applied, Vapor-Retarding Membrane Air Barrier: Elastomeric, modified bituminous or synthetic polymer membrane.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Elastomeric, Modified Bituminous Membrane:
 - 1) Carlisle Coatings & Waterproofing Inc.; Barriseal R or Barriseal S.
 - 2) Epro Services, Inc.; Ecoflex-R or Ecoflex-S.
 - 3) Henry Company; Air-Bloc 06 WB.
 - 4) Meadows, W. R., Inc.; Air-Shield LM.
 - 5) Tremco Incorporated, an RPM company; ExoAir 120SP/R.
 - b. Synthetic Polymer Membrane:
 - 1) Grace, W. R., & Co. - Conn.; Perm-A-Barrier Liquid.
 - 2) Henry Company; Air-Bloc 32.
2. Physical and Performance Properties:
 - a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference; ASTM E 2178.
 - b. Vapor Permeance: Maximum 0.1 perm (5.8 ng/Pa x s x sq. m); ASTM E 96/E 96M.
 - c. Ultimate Elongation: Minimum 500 percent; ASTM D 412, Die C.

2.4 ACCESSORY MATERIALS

- A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.
- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.
- C. Counterflashing Strip: Modified bituminous, 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 32 mils (0.8 mm) of rubberized asphalt laminated to an 8-mil- (0.2-mm-) thick, cross-laminated polyethylene film with release liner backing.
- D. Modified Bituminous Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.
- E. Joint Reinforcing Strip: Air-barrier manufacturer's glass-fiber-mesh tape.
- F. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- G. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- H. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch (0.5 mm) thick, and Series 300 stainless-steel fasteners.

- I. Sprayed Polyurethane Foam Sealant: One- or two-component, foamed-in-place, polyurethane foam sealant, 1.5- to 2.0-lb/cu. ft (24- to 32-kg/cu. m) density; flame-spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.
- J. Modified Bituminous Transition Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.
- K. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 079200 "Joint Sealants."
- L. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 - 2. Verify that concrete has cured and aged for minimum time period recommended by air-barrier manufacturer.
 - 3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 JOINT TREATMENT

- A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air-barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.
 - 1. Prime substrate and apply a single thickness of air-barrier manufacturer's recommended preparation coat extending a minimum of 3 inches (75 mm) along each side of joints and cracks. Apply a double thickness of fluid air-barrier material and embed a joint reinforcing strip in preparation coat.

3.4 TRANSITION STRIP INSTALLATION

- A. General: Install strips, transition strips, and accessory materials according to air-barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
 - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install modified bituminous strip on roofing membrane or base flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by fluid air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- C. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- E. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply modified bituminous transition strip so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.
 - 1. Modified Bituminous Transition Strip: Roll firmly to enhance adhesion.
- G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.

- H. Seal top of through-wall flashings to air-barrier sheet with an additional 6-inch- (150-mm-) wide, strip of the following material:
 - 1. Modified bituminous strip for non-metallic through-wall flashings.
 - 2. Counterflashing strip for metal through-wall flashings.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction.

3.5 FLUID AIR-BARRIER MEMBRANE INSTALLATION

- A. General: Apply fluid air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions. Apply fluid air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. If recommended by air barrier manufacturer, apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by fluid air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 3. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- B. Membrane Air Barriers: Apply a continuous unbroken air-barrier membrane to substrates according to the following thickness. Apply air-barrier membrane in full contact around protrusions such as masonry ties.
 - 1. Vapor-Retarding Membrane Air Barrier: Total dry film thickness as recommended in writing by manufacturer to meet performance requirements, but not less than 40-mil (1.0-mm) dry film thickness, applied in one or more equal coats.
- C. Apply strip and transition strip a minimum of 1 inch (25 mm) onto cured air-barrier material or strip and transition strip over cured air-barrier material overlapping 3 inches (75 mm) onto each surface according to air-barrier manufacturer's written instructions.
- D. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- E. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.6 FIELD QUALITY CONTROL

- A. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Continuous structural support of air-barrier system has been provided.

3. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
4. Site conditions for application temperature and dryness of substrates have been maintained.
5. Maximum exposure time of materials to UV deterioration has not been exceeded.
6. Surfaces have been primed, if applicable.
7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
8. Termination mastic has been applied on cut edges.
9. Strips and transition strips have been firmly adhered to substrate.
10. Compatible materials have been used.
11. Transitions at changes in direction and structural support at gaps have been provided.
12. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
13. All penetrations have been sealed.
14. Application thickness complies with manufacturer's recommendations to meet performance requirements.

B. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Remove and replace deficient air-barrier components for retesting as specified above.

C. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

3.7 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.
2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

C. Remove masking materials after installation.

END OF SECTION



SECTION 074649
POLY-ASH SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Poly-ash siding.

1.2 RELATED REQUIREMENTS

- A. Section 099113 – Exterior Painting: Field painting poly-ash siding with topcoat is covered in Exterior Painting Systems - United States: Wood. Follow manufacturer's written instructions for preparation and application.
- B. REFERENCE STANDARDS
- C. American Wood Protection Association (AWPA) (www.awpa.com):
1. AWPA E1 – Standard Method for Laboratory Evaluation to Determine Resistance to Subterranean Termites.
 2. AWPA E10 – Standard Method of Testing Wood Preservatives by Laboratory Soil-Block Cultures.
- D. ASTM International (ASTM) (www.astm.org):
1. ASTM D 570 – Standard Test Method for Water Absorption of Plastics.
 2. ASTM D 1037 – Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
 3. ASTM D 1622 – Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 4. ASTM D 6109 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products.
 5. ASTM D 6341 – Standard Test Method for Determination of the Linear Coefficient of Thermal Expansion of Plastic Lumber and Plastic Lumber Shapes Between –30 and 140°F (–34.4 and 60°C).
 6. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- E. California Department of Forestry and Fire Protection (CAL FIRE) (www.fire.ca.gov):
1. Wildland-Urban Interface (WUI) CA SFM 12.7A-1 – Exterior Wall Siding and Sheathing.
- F. Progressive Engineering Inc. (PEI) (www.p-e-i.com):
1. Pei Evaluation Service – Report PER-13069.

1.3 SUBMITTALS

- A. Comply with Submittal Procedures as shown in Project Manual.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Samples: Submit manufacturer's sample of poly-ash siding.

- D. Sample Size: Minimum 6 inches by 6 inches.
- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- F. Test Reports: Submit manufacturer's test reports from testing performed by qualified, independent testing laboratories.
- G. Product Evaluation Reports: Submit manufacturer's product evaluation reports from accredited, evaluation service.
- H. Warranty Documentation: Submit manufacturer's standard warranty.

1.4 STORAGE AND HANDLING

- A. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Store poly-ash siding on flat, level surface, raised above floor or ground, with adequate support to prevent sagging.
 - 3. Keep poly-ash siding covered and free of dirt and debris until installation.
 - 4. Protect materials and finish during storage, handling, and installation to prevent damage.

1.5 WARRANTY

- A. Warranty Period for Poly-Ash Siding: 20 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: Boral Composites Inc., 200 Mansell Court East, Suite 305, Roswell, Georgia 30076. Toll Free 888-926-7259. Website www.boraltruexterior.com. E- mail info@truexterior.com.

2.2 POLY- ASH SIDING

- A. Poly-Ash Siding: "Boral TruExterior" siding.
 - 1. Shiplap siding used as exterior wall covering over sheathing on wood stud framing.
 - 2. Material: Polymeric blend, fly ash, and glass fibers.
 - 3. Formed in continuous process, cut to 16-foot lengths, and milled to give a surface profile.
 - 4. Width: Cove / Dutch Lap 9-1/4 inches. Nominal Thickness: 3/4 inch.
 - 5. Exposed Texture: Smooth.
 - 6. Nonstructural material.
- B. Listings and Reports:
 - 1. Cal Fire (WUI), CA SFM 12.7A-1: Listing No. 8140-2134:0103.
 - 2. Product Evaluation Report: Pei Evaluation Service, Report PER-13069.

- C. Recycled Content:
 - 1. Post-Industrial Recycled Content: Minimum 70 percent, by weight.
 - 2. Post-Consumer Recycled Content: Minimum 2 percent, by weight.

- D. Properties:
 - 1. Density, ASTM D 1622: 40 to 50 pcf.
 - 2. Flexural Strength, ASTM D 6109: Greater than 1,600 psi.
 - 3. Coefficient of Linear Expansion, ASTM D 6341: Less than 1.40 E-05 in/in/degree F.
 - 4. Impact Resistance, ASTM D 1037: Greater than 50 inches.

- E. Performance:
 - 1. Fungi Rot, AWWA E10:
 - a. Brown Rot: Negligible loss.
 - b. White Rot: Negligible loss.
 - 2. Termite Resistance, AWWA E1: Greater than 9.0 (10 being best).
 - 3. Water Absorption, ASTM D 570: Less than 1.5 percent.
 - 4. Surface Burning Characteristics, ASTM E 84:
 - a. Flame Spread Index: Less than 35.
 - b. Smoke Developed Index: Less than 450.

2.3 FABRICATION

- A. Manufacturing Tolerances:
 - 1. Width: Plus or minus 1/16 inch.
 - 2. Thickness: Plus or minus 1/16 inch.
 - 3. Length: Plus 2 inches, minus 0 inch.

2.4 FINISHES

- A. Primer:
 - 1. Acrylic based.
 - 2. Low VOC.
 - 3. Factory applied.

2.5 ACCESSORIES

- A. Fasteners:
 - 1. Minimum 8d by 2-1/2-inch-long stainless steel ring-shank nails.
 - 2. In accordance with local building code.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine wood framing members to receive poly-ash siding.
- B. Notify Architect of conditions that would adversely affect installation.
- C. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install poly-ash siding in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Do not install poly-ash siding in structural or load-bearing applications.
- C. Install poly-ash siding plumb, level, square, and true to line.
- D. Fastening: Install fasteners in accordance with local building code.
- E. Painting:
 - 1. Apply topcoat of exterior paint over factory-applied primer:
 - a. Within 60 days of installing poly-ash siding.
 - b. As specified in Section 099113.
 - 2. Ensure poly-ash siding is clean and dry before painting.

3.3 ADJUSTING

- A. Repair minor damages to poly-ash siding in accordance with manufacturer's instructions and as approved by Architect.
- B. Remove and replace with new material, damaged poly-ash siding that cannot be successfully repaired, as determined by Architect.

3.4 PROTECTION

- A. Protect installed poly-ash siding to ensure that, except for normal weathering, siding will be without damage or deterioration at time of Substantial Completion.

END OF SECTION



SECTION 075216

SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.
2. Roof insulation.

B. Related Requirements:

1. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings, counterflashings, and splash pans.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- ###### A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- ###### A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.4 PREINSTALLATION MEETINGS

A. Pre-installation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

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SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:
 - 1. Base flashings and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Crickets, saddles, and tapered edge strips, including slopes.
 - 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 - 1. Cap sheet, of color required.
 - 2. Flashing sheet, of color required.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of complying with performance requirements.
- C. Research/Evaluation Reports: For components of membrane roofing system, from ICC-ES.
- D. Field quality-control reports.
- E. Sample Warranties: For manufacturer's special warranties.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is FM Global approved for membrane roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of roofing system.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Firestone Building Products.
 - 2. Johns Manville.
 - 3. Siplast, Inc.
- B. Source Limitations: Obtain components including roof insulation and fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a roofing system, and shall be listed in FM Global's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
1. Fire/Windstorm Classification: Class 1A-90.
 2. Hail-Resistance Rating: MH.

2.3 ROOFING SHEET MATERIALS

- A. Roofing Membrane Sheet: ASTM D 6162, Grade S, Type I or II, SBS-modified asphalt sheet (reinforced with a combination of polyester fabric and glass fibers); smooth surfaced; suitable for application method specified.
- B. Granule-Surfaced Roofing Cap Sheet: ASTM D 6162, Grade G, Type I or II, SBS-modified asphalt sheet (reinforced with a combination of polyester fabric and glass fibers); granule surfaced; suitable for application method specified, and as follows:
1. Granule Color: As selected by Architect.

2.4 BASE FLASHING SHEET MATERIALS

- A. Backer Sheet: ASTM D 6162, Grade S, Type I or II, SBS-modified asphalt sheet (reinforced with a combination of polyester fabric and glass fibers); smooth surfaced; suitable for application method specified.
- B. Granule-Surfaced Flashing Sheet: ASTM D 6162, Grade G, Type I or II, SBS-modified asphalt sheet (reinforced with a combination of polyester fabric and glass fibers); granule surfaced; suitable for application method specified, and as follows:
1. Granule Color: Match granule-surfaced roofing cap sheet.

2.5 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with roofing membrane and base flashings.

- C. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- D. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- F. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 (2.36-mm) sieve and 98 percent of mass retained on No. 40 (0.425-mm) sieve, color to match roofing.
- G. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

2.6 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by roofing system manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.7 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- D. Tapered Edge Strips: ASTM C 728, perlite insulation board.
- E. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch (13 mm) thick.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corporation; GlasRoc Sheathing.
 - b. Georgia-Pacific Corporation; Dens Deck Prime.
 - c. National Gypsum Company; Gold Bond eXP Extended Exposure Sheathing.
 - d. Temple-Inland, Inc; GreenGlass Exterior Sheathing.
 - e. USG Corporation; Securock Glass Mat Roof Board.

F. Substrate Joint Tape: 6- or 8-inch- (150- or 200-mm-) wide, coated, glass fiber.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 05 3100 "Steel Decking."
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION, GENERAL

- A. Comply with roofing system manufacturer's written instructions.
- B. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.4 INSULATION INSTALLATION

- A. Install tapered insulation under area of roofing to conform to slopes indicated.
- B. Install insulation with long joints of insulation in a continuous straight line, with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
- D. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- E. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 1. Fasten first layer of insulation according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification.
 2. Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- F. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing system manufacturer.
 1. Fasten cover boards according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification.
 2. Apply hot roofing asphalt to underside, and immediately bond cover board to substrate.

3.5 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:
 1. Deck Type: I (insulated).
 2. Adhering Method: L (cold-applied adhesive).
 3. Number of SBS-Modified Asphalt Sheets: One.
 4. Surfacing Type: M (mineral-granule-surfaced cap sheet).
- B. Coordinate installation of roofing system so insulation and other components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 1. Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
 2. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system.
 3. Remove and discard temporary seals before beginning work on adjoining roofing.

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

- A. Install modified bituminous roofing sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
 - 1. Adhere to substrate in cold-applied adhesive.
 - 2. Unroll roofing sheets and allow them to relax for minimum time period required by manufacturer.
- B. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
 - 2. Apply roofing granules to cover exuded bead at laps while bead is hot.
- C. Install roofing sheets so side and end laps shed water.

3.7 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 - 2. Backer-Sheet Application: Adhere backer sheet to substrate in cold-applied adhesive.
 - 3. to back of flashing sheet if recommended by roofing system manufacturer.
 - 4. Flashing-Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive at rate required by roofing system manufacturer.
- B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
 - 1. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.
- D. Install roofing cap-sheet stripping where metal flanges and edgings are set on roofing according to roofing system manufacturer's written instructions.

3.8 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
 - 1. Notify Architect and Owner 3 days in advance of date and time of inspection.
- B. Roofing system will be considered defective if it does not pass tests and inspections.
 - 1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.9 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION



SECTION 076200

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets.
2. Formed low-slope roof sheet metal fabrications.
3. Formed wall sheet metal fabrications.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 075216 "SBS Modified Bituminous Membrane Roofing" for installing sheet metal flashing and trim integral with roofing.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- ###### A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 COORDINATION

- ###### A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- ###### B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

C. Samples for Verification: For each type of exposed finish.

1.5 QUALITY ASSURANCE

- ###### A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.7 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial

Completion. PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance

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required; with smooth, flat surface.

1. Exposed Coil-Coated Finish: Two-coat fluoropolymer; AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Color: As selected by Architect from manufacturer's full range.
 2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).
- C. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, dead soft, fully annealed; with smooth, flat surface.
1. Finish: 2D (dull, cold rolled).

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Grace Construction Products, a unit of W. R. Grace & Co.-Conn.; Grace Ice and Water Shield HT.
 - b. Henry Company; Blueskin PE200 HT.
 - c. Owens Corning; WeatherLock Specialty Tile & Metal Underlayment.
 - d. Protecto Wrap Company; Protecto Jiffy Seal Ice & Water Guard HT.
 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.
- B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. (0.16 kg/sq. m) minimum.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder if applicable, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Blind Fasteners: Stainless-steel rivets suitable for metal being fastened.

2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- C. Solder for Stainless Steel: ASTM B 32, Grade Sn60 or Grade Sn96, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.
- 2.5 MANUFACTURED REGLETS
- A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated.
1. Material: Stainless steel, 0.019 inch (0.48 mm) thick.
 2. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
 3. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.

2.6 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 2. Obtain field measurements for accurate fit before shop fabrication.
 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on

Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- G. Seams for Metals Being Soldered: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- H. Seams for Aluminum with Painted or Coated Finishes: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 12- foot- (3.6-m-) long sections. Shop fabricate interior and exterior corners.
 - 1. Joint Style: Butted with expansion space and 6-inch- (150-mm-) wide, concealed backup plate.
 - 2. Fabricate from the following material:
 - a. Aluminum: 0.050 inch (1.27 mm) thick.
- B. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following material:
 - 1. Aluminum: 0.032 inch (0.81 mm) thick.
- C. Roof-Penetration Flashing: Fabricate from the following material:
 - 1. Stainless Steel: 0.019 inch (0.48 mm) thick.
- D. Splash Pans: Fabricate to dimensions and shape required to protect lower roof from water draining from elevator override roof, but not less than 18 inches (457 mm) wide by full width of elevator override roof, and from the following material:
 - 1. Stainless Steel: 0.019 inch (0.48 mm) thick.

2.8 WALL SHEET METAL FABRICATIONS

- A. Opening Flashings: Fabricate head, sill, jamb, and similar flashings to extend 4 inches (100

mm) beyond wall openings. Form head and sill flashing with 2-inch- (50-mm-) high, end dams. Fabricate from the following material:

1. Aluminum, 0.032 inch (0.81 mm) thick; unless otherwise indicated.
2. Stainless steel, 0.016 inch (0.40 mm) thick; for flashings in contact with concrete or masonry.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 1. Verify compliance with requirements for installation tolerances of substrates.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.
- B. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 3. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 4. Torch cutting of sheet metal flashing and trim is not permitted.

- B. **Metal Protection:** Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. **Underlayment:** Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. **Expansion Provisions:** Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. **Fasteners:** Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. **Soldered Joints:** Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder aluminum sheet.
 2. Do not use torches for soldering.
 3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 4. **Stainless-Steel Soldering:** Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.4 ROOF FLASHING INSTALLATION

- A. **General:** Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard.

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Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

- B. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant unless otherwise indicated.
- C. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric or butyl sealant and clamp flashing to pipes that penetrate roof.
- D. Splash Pans: Install where elevator override roof drains onto lower roofs. Set in asphalt roofing cement or elastomeric sealant compatible with the substrate.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.6 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION



SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-staining silicone joint sealants.
2. Urethane joint sealants.
3. Mildew-resistant joint sealants.
4. Butyl joint sealants.
5. Latex joint sealants.
6. Acoustical joint sealants.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- ###### A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- ###### A. Product Data: For each joint-sealant product.

- ###### B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

- ###### C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

- ###### D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- ###### A. Qualification Data: For qualified testing agency.

- ###### B. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency, or by manufacturer and witnessed by a qualified testing agency .

- ###### C. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:

1. Joint-sealant location and designation.
 2. Manufacturer and product name.
 3. Type of substrate material.
 4. Proposed test.
 5. Number of samples required.
- D. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- E. Field-Adhesion-Test Reports: For each sealant application tested.
- F. Sample Warranties: For special warranties.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- C. Mockups: Install sealant in representative areas of exterior glazing assemblies indicated to receive joint sealants, using materials and installation methods specified in this Section.
1. Install sealant mockups at no fewer than five locations as directed by Architect, with each mockup not less than 48 inches in length.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 2. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 3. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

5. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
6. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

1.7 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint- sealant manufacturer or are below 40 deg F (5 deg C).
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: 2 years from date of Substantial Completion.
- B. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Acoustical Joint Sealants: Provide acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies according to ASTM E 90.

- C. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:
 - 1. Architectural sealants shall have a VOC content of 250 g/L or less.
- D. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 NONSTAINING SILICONE JOINT SEALANTS

- A. Non-staining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. May National Associates, Inc., a subsidiary of Sika Corporation U.S.; Bondaflex Sil 290 FPS-NB or Bondaflex Sil 290 NB.
 - b. Pecora Corporation; 890FTS/TXTR or 890 NST.
 - c. Tremco Incorporated; Spectrem 1.
- C. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 795.
 - b. GE Construction Sealants; SilPruf NB.
 - c. May National Associates, Inc., a subsidiary of Sika Corporation U.S.; Bondaflex Sil 295 FPS NB.
 - d. Tremco Incorporated; Spectrem 2 or Spectrem 3.

2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Construction Chemicals, LLC, Building Systems; Sonalastic TX1.
 - b. ER Systems, an ITW Company; Pacific Polymers Elasto-Thane 230 MP.
 - c. Pecora Corporation; Dynatrol I-XL.
 - d. Polymeric Systems, Inc.; Flexiprene 1000.
 - e. Schnee-Morehead, Inc., an ITW company; Permathane SM7108.
 - f. Sherwin-Williams Company (The); Stampede-1 or Stampede-TX.
 - g. Sika Corporation U.S.; Sikaflex Textured Sealant.
 - h. Tremco Incorporated; Dymonic.

- B. Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Construction Chemicals, LLC, Building Systems; Sonolastic SL 1.
 - b. Pecora Corporation; NR-201.
 - c. Polymeric Systems, Inc.; Flexiprene 952.
 - d. Schnee-Morehead, Inc.; an ITW company; Permthane SM7101.
 - e. Sherwin-Williams Company (The); Stampede 1SL.

- C. Urethane, M, NS, 50, NT: Multicomponent, nonsag, plus 50 percent and minus 50 percent movement capability nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 50, Use NT.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Pecora Corporation; Dynatrol II.

- D. Urethane, M, NS, 25, T, NT: Multicomponent, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 25, Uses T and NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Bostik, Inc.; Chem-Calk 505.
 - b. Sika Corporation U.S.; Sikaflex - 2c NS EZ Mix.

2.4 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 786-M White.
 - b. GE Construction Sealants; SCS1700 Sanitary.
 - c. May National Associates, Inc., a subsidiary of Sika Corporation U.S.; Bondaflex Sil 100 WF.
 - d. Soudal USA; RTV GP.
 - e. Tremco Incorporated; Tremsil 200.

2.5 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C 1311.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Bostik, Inc.; Chem-Calk 300.
 - b. Pecora Corporation; BC-158.

2.6 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Construction Chemicals, LLC, Building Systems; Sonolac.
 - b. May National Associates, Inc., a subsidiary of Sika Corporation U.S.; Bondaflex 600 or Bondaflex Sil-A 700.
 - c. Pecora Corporation; AC-20.
 - d. Sherwin-Williams Company (The); 850A, 950A, or PowerHouse.
 - e. Tremco Incorporated; Tremflex 834.

2.7 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C 834.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Accumetric LLC; BOSS 826 Acoustical Sound Sealant.
 - b. GE Construction Sealants; RCS20 Acoustical.
 - c. Grabber Construction Products; Acoustical Sealant GSC.
 - d. Henkel Corporation; OSI Pro-Series SC-175 Acoustical Sound Sealant.
 - e. Pecora Corporation; AC-20 FTR or AIS-919.
 - f. Serious Energy Inc.; Quiet Seal Pro.
 - g. Tremco, Incorporated; Tremco Acoustical Sealant.
 - h. USG Corporation; SHEETROCK Acoustical Sealant.
- B. Acoustical Sealant for Concealed Joints: Manufacturer's standard nonsag, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber acoustical sealant.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Pecora Corporation; BA-98.
 - b. Serious Energy Inc.; Quiet Seal 350.

2.8 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Construction Chemicals, LLC, Building Systems.
 - b. Construction Foam Products, a division of Nomaco, Inc.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type B (bicellular material with a surface skin), or either of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.9 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint- sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C 919, ASTM C 1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.
- G. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet (300 m) of joint length thereafter or one test per each floor per elevation.
 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere

to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. General: Provide joint sealants for each application as scheduled in this Article or as indicated on Drawings to comply with requirements in this Section.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Joints between metal panels.
 - c. Joints between different materials.
 - d. Perimeter joints between materials listed above and frames of doors, windows and other glazing systems, and louvers.
 - e. Control and expansion joints in ceilings and other overhead surfaces.
 - f. Other joints as indicated on Drawings.
 2. Joint Sealant: Silicone, nonstaining, S, NS, 100/50 or 50, NT.

- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Urethane, S, P, 25, T, NT; or Urethane, M, NS, 25, T, NT.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Vertical joints on exposed surfaces of unit masonry and concrete walls and partitions.
 - c. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Urethane, S, NS, 25, NT; or Urethane, S, NS, 50, NT.
- E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
 - 1. Joint Locations:
 - a. Control joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors, glazed openings, and elevator entrances.
 - c. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Acrylic latex.
- F. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
- G. Joint-Sealant Application: Concealed mastics.
 - 1. Joint Locations:
 - a. Aluminum thresholds.
 - b. Sill plates.
 - c. Other joints as indicated on Drawings.

- H. Joint Sealant: Butyl-rubber based. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Location:
 - a. Acoustical joints where indicated.
 - b. Other joints as indicated.
 2. Joint Sealant: Acoustical sealant.

END OF SECTION



HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Hollow-metal work.
- B. Related Requirements:
 - 1. Section 084113 "Aluminum Framed Entrances and Storefronts" for aluminum door-frame units to receive exterior hollow metal doors.
 - 2. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, joints, field splices, and connections.
 - 7. Details of accessories.
- C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

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1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Amweld International, LLC.
 - 2. Ceco Door Products; an Assa Abloy Group company.
 - 3. Curries Company; an Assa Abloy Group company.
 - 4. Deansteel.
 - 5. Door Components, Inc.
 - 6. Mesker Door Inc.
 - 7. Pioneer Industries, Inc.
 - 8. Republic Doors and Frames.
 - 9. Security Metal Products Corp.
 - 10. Steelcraft; an Ingersoll-Rand company.
- B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
 - 1. Physical Performance: Level A according to SDI A250.4.
 - 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - d. Edge Construction: Model 2, Seamless.

3. Core: Manufacturer's standard, unless otherwise indicated. Frames:
 - a. Materials: Uncoated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - b. Construction: Full profile welded, unless otherwise indicated; slip-on drywall where frame is installed in existing stud wall.
4. Exposed Finish: Prime.

2.3 EXTERIOR HOLLOW-METAL DOORS

- A. Construct exterior doors to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Maximum-Duty Doors: SDI A250.8, Level 4.
 1. Physical Performance: Level A according to SDI A250.4.
 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm.)
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.067 inch (1.7 mm), with minimum A40 (ZF120) coating.
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Vertical steel stiffeners with manufacturer's standard insulation material.
 - 1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu (0.370 K x sq. m/W) when tested according to ASTM C 1363.
 3. Frames: Aluminum door-frame units as specified in Section 084113 "Aluminum Framed Entrances and Storefronts."
 4. Exposed Door Finish: Prime.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
 2. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
 3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.5 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- H. Glazing: Comply with requirements in Section 088000 "Glazing."

2.6 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with

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vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.

2. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches (3.2 mm in 51 mm) unless otherwise indicated.
 3. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
 4. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
- C. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 2. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 3. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
 - b. Compression Type: Not less than two anchors in each frame.
 - c. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
 4. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
 5. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping

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according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- F. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow- metal work.
 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 4. Provide loose stops and moldings on inside of hollow-metal work.
 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.7 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - b. Install frames with removable stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.
 - 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 - 4. In-Place Concrete or Masonry Construction: Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 - 5. In-Place Metal-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.

- 6. Installation Tolerances: Adjust hollow-metal door frames for squareness,

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alignment, twist, and plumb to the following tolerances:

- a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 2. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
 3. At Bottom of Door: 3/4 inch (19.1 mm) plus or minus 1/32 inch (0.8 mm).
 4. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION



SECTION 081416

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- ###### A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- ###### A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

- ###### B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Undercuts.
4. Requirements for veneer matching.
5. Factory finish requirements.

- ###### C. Samples for Initial Selection: For factory-finished doors.

- ###### D. Samples for Verification: Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

1.4 INFORMATIONAL SUBMITTALS

- ###### A. Sample Warranty: For special warranty.

- ###### B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.5 QUALITY ASSURANCE

- ###### A. Manufacturer Qualifications: A qualified manufacturer that is a certified participant in AWI's Quality Certification Program.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
 - 2. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Algoma Hardwoods, Inc.
 - 2. Eggers Industries.
 - 3. Graham Wood Doors; an Assa Abloy Group company.
 - 4. Marshfield Door Systems, Inc.
 - 5. Mohawk Doors; a Masonite company.
 - 6. VT Industries, Inc.
- B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI "Architectural Woodwork Standards."
 - 1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.

2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.
- B. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.
- C. Structural-Composite-Lumber-Core Doors:
1. Structural Composite Lumber: WDMA I.S.10.
- 2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH
- A. Interior Solid-Core Doors:
1. Grade: Custom (Grade A faces).
 2. Species and Cut: Match veneer species and cut of existing wood doors.
 3. Veneer Matching: Match veneer assembly of existing wood doors.
 4. Exposed Vertical Edges: Same species as faces.
 5. Core: Structural composite lumber.
 6. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.
- 2.4 FABRICATION
- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
- 2.5 FACTORY FINISHING
- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors.
- C. Transparent Finish:
1. Grade: Custom.
 2. Finish: AWI "Architectural Woodwork Standards" System 5, conversion varnish, System 9, UV curable, acrylated epoxy, polyester, or urethane, System 10, UV curable, water based, or System 11, catalyzed polyurethane.

3. Staining: Match color of existing wood doors as approved by Architect.
4. Sheen: Match sheen of existing wood doors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION



SECTION 083100

ACCESS DOORS AND PANELS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: Access doors and frames for walls and ceilings.
- B. Provide access doors where required for access to concealed equipment, in sizes and locations as approved by Architect.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, fire ratings, materials, individual components and profiles, and finishes.
- B. Product Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

PART 2 – PRODUCTS

2.1 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Babcock-Davis.
 - 2. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
 - 3. Karp Associates, Inc.
 - 4. Larsen's Manufacturing Company.
 - 5. Milcor Inc.
 - 6. Nystrom, Inc.
- B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.

C. Non-Rated Flush Access Doors:

1. Assembly Description: Fabricate door to fit flush to frame.
 - a. Concealed Flange: Provide frame with gypsum board beads for concealed flange installation, for installation in gypsum board surfaces. Provide frame with plaster beads for concealed flange installation, for installation in plaster surfaces.
2. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage; with factory primed finish.
3. Frame Material: Same material, thickness, and finish as door.
4. Hinges: Manufacturer's standard.
5. Latch: Cam latch operated by screwdriver.

2.2 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- C. Frame Anchors: Same type as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
 1. For concealed flanges with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.
 2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
 3. Provide mounting holes in frames for attachment of units to metal or wood framing.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast. Steel Finishes:
 - 1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION



SECTION 084113

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior storefront framing.
2. Exterior manual-swing entrance doors, including doors in glazed curtain wall systems.
3. Door-frame units to receive exterior hollow metal doors.

B. Related Requirements:

1. Section 081113 "Hollow Metal Doors and Frames" for hollow metal doors installed in aluminum frames.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- ###### A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 PREINSTALLATION MEETINGS

- ###### A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.

2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
- C. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- D. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch (300-mm) lengths of full-size components and showing details of the following:
 1. Joinery, including concealed welds.
 2. Anchorage.
 3. Expansion provisions.
 4. Glazing.
 5. Flashing and drainage.
- E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.
 1. Basis for Certification: NFRC-certified energy performance values for each aluminum- framed entrance and storefront.
- C. Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by a qualified testing agency.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - c. Water penetration through fixed glazing and framing areas.
 - d. Failure of operating components.
 - 2. Warranty Period: 2 years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design aluminum-framed entrances and storefronts.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- C. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm).

E. Operable Units: Provide a minimum 1/16-inch (1.6-mm) clearance between framing members and operable units. Structural: Test according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air-pressure differential of 6.24 lbf/sq. ft. (300 Pa).
2. Entrance Doors:
 - a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. (5.08 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
 - b. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. (2.54 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft. (480 Pa).

H. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.45 Btu/sq. ft. x h x deg F (2.55 W/sq. m x K) as determined

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- according to NFRC 100.
2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.35 as determined according to NFRC 200.
 3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 15 as determined according to NFRC 500.
- I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. EFCO Corporation.
 2. Kawneer North America.
 3. Oldcastle BuildingEnvelope.
- B. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer and from same manufacturer of glazed curtain walls.

2.3 FRAMING

- A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Construction: Thermally broken.
 2. Glazing System: Retained mechanically with gaskets on four sides.
 3. Finish: Clear anodic finish.
 4. Fabrication Method: Field-fabricated stick system.
- B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.
- D. Materials:
1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - a. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 - b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 - c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
 - d. Structural Profiles: ASTM B 308/B 308M.

2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
 - a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
 1. Door Construction: 2-inch (50.8-mm) overall thickness, with minimum 0.188-inch- (4.8- mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 2. Door Design: Wide stile; 5-inch (127-mm) nominal width. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide non-removable glazing stops on outside of door.

2.5 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."
- B. Weather Stripping: Manufacturer's standard replaceable components.
 1. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC.
 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
- C. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

2.6 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.7 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, fabricated from 300 series stainless steel.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- C. Concealed Flashing: Dead-soft, 0.018-inch- (0.457-mm-) thick stainless steel, ASTM A 240/A 240M of type recommended by manufacturer.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.8 AUXILIARY COMPONENTS

- A. Fillers, Trim and Closures: Provide filler panels, trim, cover plates, and other closures, for both exterior and interior conditions as shown, complete with anchors for support to structure. Allow for erection tolerances and provide for movement of storefront due to thermal expansion and building deflections, as indicated.
 - 1. Fabricate fillers, trim and closures from extruded aluminum unless otherwise indicated; fabricate from brake metal where indicated.
 - 2. Exposed Finish: Match storefront framing.

2.9 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Physical and thermal isolation of glazing from framing members.

4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 5. Provisions for field replacement of glazing from exterior.
 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
1. At exterior doors, provide compression weather stripping at fixed stops.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
 2. At exterior doors, provide weather sweeps applied to door bottoms.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.10 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General:
1. Comply with manufacturer's written instructions.
 2. Do not install damaged components.
 3. Fit joints to produce hairline joints free of burrs and distortion.
 4. Rigidly secure non-movement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic

deterioration and to prevent impeding movement of moving joints.

6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 088000 "Glazing."

G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.3 ERECTION TOLERANCES

A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
 - c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).
4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

END OF SECTION



SECTION 084413

GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Glazed aluminum curtain walls.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
 - 2. Include full-size isometric details of each vertical-to-horizontal intersection of glazed aluminum curtain walls, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
 - 3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- D. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch (300-mm) lengths of full-size components and showing details of the following:
 - 1. Joinery, including concealed welds.
 - 2. Anchorage.
 - 3. Expansion provisions.

4. Glazing.
5. Flashing and drainage.

- E. Delegated-Design Submittal: For glazed aluminum curtain walls indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Energy Performance Certificates: For glazed aluminum curtain walls, accessories, and components from manufacturer.
 1. Basis for Certification: NFRC-certified energy performance values for each glazed aluminum curtain wall.
- C. Product Test Reports: For glazed aluminum curtain walls, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Field quality-control reports.
- E. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For glazed aluminum curtain walls to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 WARRANTY

- A. Special Assembly Warranty: Manufacturer agrees to repair or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.

- c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- d. Water penetration through fixed glazing and framing areas.
- e. Failure of operating components.

2. Warranty Period: 2 years from date of Substantial

Completion. PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01450 "Contractor's Quality Control," to design glazed aluminum curtain walls.
- B. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- C. Structural Loads:
 1. Wind Loads: As indicated on Drawings.
 2. Other Design Loads: As indicated on Drawings.
- D. Deflection of Framing Members: At design wind pressure, as follows:
 1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
 2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm).
 - a. Operable Units: Provide a minimum 1/16-inch (1.6-mm) clearance between framing members and operable units.
- E. Structural: Test according to ASTM E 330 as follows:
 1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures,

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assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.

3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air- pressure differential of 6.24 lbf/sq. ft. (300 Pa).

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind- load design pressure, but not less than 10 lbf/sq. ft. (480 Pa).

H. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.45 Btu/sq. ft. x h x deg F (2.55 W/sq. m x K) as determined according to NFRC 100.
2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.35 as determined according to NFRC 200.
3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 74 for frame and 60 for glazing as determined according to NFRC 500.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Kawneer North America; 2250 L-R Wall, or comparable product by one of the following:

1. EFCO Corporation.
2. Oldcastle Building Envelope.

B. Source Limitations: Obtain all components of curtain wall system, including framing and accessories, from single manufacturer and from same manufacturer of aluminum-framed storefront systems.

2.3 FRAMING

1. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to

- support imposed loads. Construction: Thermally broken.
 - 2. Glazing System: Retained mechanically with gaskets on four sides.
 - 3. Finish: Clear anodic finish.
 - 4. Fabrication Method: Field-fabricated stick system.

- B. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.
 - 1. Include snap-on aluminum trim that conceals fasteners.

- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

- D. Materials:
 - 1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - a. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 - b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 - c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
 - d. Structural Profiles: ASTM B 308/B 308M.

 - 2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
 - a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 ENTRANCES

- A. Entrances: Comply with Section 084113 "Aluminum-Framed Entrances and Storefronts."

- B. Entrance Frame Adapters: Manufacturer's standard system designed to integrate specified entrance doors into curtain wall system.

- C. Weather Stripping: Manufacturer's standard replaceable components.
 - 1. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC.
 - 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

- D. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

2.5 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.6 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, fabricated from 300 series stainless steel.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- C. Concealed Flashing: Dead-soft, 0.018-inch- (0.457-mm-) thick stainless steel, ASTM A 240/A 240M of type recommended by manufacturer.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.7 AUXILIARY COMPONENTS

- A. Fillers, Trim and Closures: Provide filler panels, trim, cover plates, and other closures, for both exterior and interior conditions as shown, complete with anchors for support to structure. Allow for erection tolerances and provide for movement of storefront due to thermal expansion and building deflections, as indicated.
 - 1. Fabricate fillers, trim and closures from extruded aluminum unless otherwise indicated; fabricate from brake metal where indicated.
 - 2. Exposed Finish: Match curtain wall framing.

2.8 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by de-scaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations. Accurately

- fitted joints with ends coped or mitered.
 - 2. Physical and thermal isolation of glazing from framing members.
 - 3. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 4. Provisions for field replacement of glazing from exterior.
 - 5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Fabricate components to resist water penetration using one of the following methods:
- 1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
 - 2. Pressure-equalized system or double barrier design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.
- E. Curtain-Wall Framing: Fabricate components for assembly using manufacturer's standard assembly method.
- F. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
- 2.9 ALUMINUM FINISHES
- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure non-movement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 - 6. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
 - 7. Seal joints watertight unless otherwise indicated.

- B. Metal Protection:
 - 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
 - 2. Where aluminum is in contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
 - C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
 - D. Install components plumb and true in alignment with established lines and grades.
 - E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
 - F. Install glazing as specified in Section 088000 "Glazing."
- 3.3 ERECTION TOLERANCES
- A. Erection Tolerances: Install glazed aluminum curtain walls to comply with the following maximum tolerances:
 - 1. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
 - 2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
 - 3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
 - c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).
 - 4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on glazed aluminum curtain walls.
 - 1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
 - a. Perform a minimum of three tests in areas as directed by Architect.
- C. Glazed aluminum curtain walls will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION

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GLAZED ALUMINUM CURTAIN WALLS



SECTION 085113

ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Aluminum windows for exterior locations.
- B. Related Requirements:
 - 1. Section 088000 “Glazing” for glazing requirements for aluminum windows, including those specified to be factory- or site-glazed units.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site, scheduled to coincide with regular progress meeting.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review and discuss the finishing of aluminum windows that is required to be coordinated with the finishing of other aluminum work for color and finish matching.
 - 3. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components. Include provisions for anchorage, flashing, sealing perimeters, and protecting finishes.
 - 4. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
 - 5. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

- C. Samples for Verification: For aluminum windows and components required, showing full range of color variations for finishes, and prepared on Samples of size indicated below:
 - 1. Exposed Finishes: Not less than 2 by 4 inches (50 by 100 mm).
- D. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and Installer.
- B. Product Test Reports: For each type of aluminum window, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For manufacturer's warranties.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports, and calculations.
- B. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
 - 2. Warranty Period: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Products: The design for aluminum windows is based on the following products by TRACO:
 - 1. Project-In Windows: NX240.
 - 2. Fixed Windows: NX280.
- B. Comparable Products: Subject to compliance with requirements, provide the basis-of-design products indicated, or comparable products by one of the following:
 - 1. Arcadia Incorporated.
 - 2. EFCO Corporation.
 - 3. Kawneer North America; an Alcoa company.
 - 4. YKK AP America Inc.
- C. Source Limitations: Obtain aluminum windows from single source from single manufacturer.

2.2 WINDOW PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
 - 1. Window Certification: AMMA certified with label attached to each window.
- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
 - 1. Minimum Performance Class and Grade: C-50.
- C. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 51 for operable windows and 57 for fixed windows.
- D. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C) material surfaces.

2.3 ALUMINUM WINDOWS

- A. Operating Types: Provide the operating types in locations indicated on Drawings.
- B. Frames and Sashes: Aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.

1. Frame Type: Nailing flange.
 2. Thermally Improved Construction: Fabricate frames, sashes, and muntins with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.
- C. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
- D. Hardware, General: Provide manufacturer's standard hardware fabricated from 300 Series stainless-steel; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.
1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
- E. Projected Window Hardware:
1. Hinges: Stainless-steel, non-friction type, not less than two per sash.
 2. Lock: White bronze lever handle and cam-action lock with keeper. Provide one per vent up to 36 inch (914 mm) width; two per vent more than 36 inch (914 mm) width.
 3. Limit Devices: Stainless-steel limit devices designed to restrict sash opening.
 - a. Limit clear opening to 6 inches (150 mm) for ventilation; with custodial key release.
- F. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
- G. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 ACCESSORIES

- A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.
- B. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

2.5 INSECT SCREENS

- A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
 1. Type and Location: Full, inside for project-out sashes.
- B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.

1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
- C. Aluminum Wire Fabric: 18-by-16 (1.1-by-1.3-mm) mesh of 0.011-inch- (0.28-mm-) diameter, coated aluminum wire.
 1. Wire-Fabric Finish: As selected by Architect from manufacturer's full range.

2.6 FABRICATION

- A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Glaze aluminum windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.
- E. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design wind loads of window units.
- F. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
 - 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
 - 1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502.
 - 2. Air-Infiltration Testing:
 - a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
 - b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.

3. Water-Resistance Testing:
 - a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
 - b. Allowable Water Infiltration: No water penetration.
 4. Testing Extent: Test all windows by a qualified independent testing and inspecting agency. Windows shall be tested after perimeter sealants have cured.
 5. Test Reports: Prepared according to AAMA 502.
- C. Remove and replace non-complying windows and retest as specified above.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Prepare test and inspection reports.
- 3.4 ADJUSTING, CLEANING, AND PROTECTION
- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
 - B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
 1. Keep protective films and coverings in place until final cleaning.
 - C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
 - D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION



SECTION 087100
DOOR HARDWARE

PART 1 – GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Commercial door hardware for the following:

- a. Swinging doors.
b. Other doors to the extent indicated.

- B. Related Requirements:

1. Section 081113 "Hollow Metal Doors and Frames."
2. Section 081416 "Flush Wood Doors"
3. Section 084113 "Aluminum-Framed Entrances and Storefronts"

1.3 SUBMITTALS

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of door hardware indicated.

1. Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

- C. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

- a. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.

2. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
 - 1) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.
 3. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
 4. Submittal Sequence: Submit initial draft of final schedule along with essential Product Data to facilitate the fabrication of other work that is critical in the Project construction schedule. Submit the final Door Hardware Schedule after Samples, Product Data, coordination with Shop Drawings of other work, delivery schedules, and similar information has been completed and accepted.
- D. Keying Schedule: Prepared by or under the supervision of supplier, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.
- E. Product Certificates: Signed by manufacturers of electrified door hardware certifying that products furnished comply with requirements.
1. Certify that door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.
- F. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
1. Include lists of completed projects with project names and addresses of architects and owners, and other information specified.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, indicating current products comply with requirements.
- H. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.
- I. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed door hardware similar in

material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

- B. **Supplier Qualifications:** Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
1. **Scheduling Responsibility:** Preparation of door hardware and keying schedules.
 2. **Architectural Hardware Consultant Qualifications:** A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- C. **Source Limitations:** Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
- D. **Regulatory Requirements:** Comply with provisions of the following:
1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1, FED-STD-795, "Uniform Federal Accessibility Standards," as follows:
 - a. **Handles, Pulls, Latches, Locks, and other Operating Devices:** Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. **Door Closers:** Comply with the following maximum opening-force requirements indicated:
 - 1) **Interior Hinged Doors:** 5 lbf (22.2 N) applied perpendicular to door.
 - 2) **Sliding or Folding Doors:** 5 lbf (22.2 N) applied parallel to door at latch.
 - 3) **Fire Doors:** Minimum opening force allowable by authorities having jurisdiction.
 - c. **Thresholds:** Not more than 1/2 inch (13 mm) high, Not more than 3/4 inch (19 mm) high for exterior sliding doors. Bevel raised thresholds with a slope of not more than 1:2.
 2. **NFPA 101:** Comply with the following for means of egress doors:
 - a. **Latches, Locks, and Exit Devices:** Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. **Delayed-Egress Locks:** Lock releases within 15 seconds after applying a force not more than 15 lbf (67 N) for not more than 3 seconds. **Door Closers:** Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.
 - c. **Thresholds:** Not more than 1/2 inch (13 mm) high.
- E. **Keying Conference:** Conduct conference at Project site to comply with requirements in Division 1 Section 01312 "Project Meetings." Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:

1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 2. Preliminary key system schematic diagram.
 3. Requirements for key control system.
 4. Address for delivery of keys.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section 01312 "Project Meetings."
- G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section 01312 "Project Meetings." Review methods and procedures related to electrified door hardware including, but not limited to, the following:
1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 3. Review required testing, inspecting, and certifying procedures.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
 - B. Tag each item with Door Number related to the final Approved Door Hardware Schedule, and include basic installation instructions with each item or package.
 - C. Deliver keys to manufacturer of key control system, or Owner as Directed.
 - D. Deliver keys to Owner by registered mail or overnight package service.
- 1.6 COORDINATION
- A. Coordinate layout and installation of recessed pivots and closers with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section 03 3000 "Cast-in-Place Concrete."
 - B. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- 1.7 WARRANTY
- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
 - B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
 2. Faulty operation of operators and door hardware.
 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period for Locksets: Three, (3) years from date of Substantial Completion, unless otherwise indicated.
- D. Warranty Period for Manual Closers: Ten, (10) years from date of Substantial Completion, unless otherwise indicated.
- E. Warranty Period for Exit Devices: Three, (3) years from date of Substantial Completion, unless otherwise indicated.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies as used in the manufacture and installation of original products.
- C. Engage a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section, door hardware sets indicated in door and frame schedule, and the Door Hardware Schedule at the end of Part 3.
1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
 2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.2 HINGES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Butt Hinges:
 - a. Stanley Commercial Hardware
 - 2. Continuous Hinges:
 - a. Architectural Builders Hardware Mfg., Inc.
 - b. Stanley Commercial Hardware
- B. Standards: Comply with the following:
 - 1. Hinges ANSI/BHMA Standard A156.1 Grade 1
 - 2. Continuous Hinges ANSI/BHMA Standard A156.26 Grade 1
- C. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- D. Concealed bearings are made from engineered polymer material with PTFE and Aramid fiber; bearing is maintenance free, no oil, no grease.
- E. Butt hinges equipped with easily seated, non-rising pin. Hole in bottom of pin enables quick pin removal for ease of installation.
- F. Hinge Base Metal: Unless otherwise indicated, provide the following:
 - 1. Exterior Butt Hinges: Stainless Steel or Brass or Bronze
 - 2. Interior Butt Hinges: Steel or Brass or Bronze
- G. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
 - 1. Hospital Tips: Slope ends of hinge barrel.
 - 2. Maximum Security Pin: Fix pin in hinge barrel after it is inserted.
 - 3. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - a. Outswinging exterior doors.
 - b. Outswinging corridor doors with locks.
- H. Continuous-Geared Aluminum Hinges: Minimum **0.120-inch- (3.0-mm-)** thick, hinge leaves with minimum overall width of **4 inches (100 mm)**; fabricated to full height of door and frame. Finish components after milling and drilling are complete. Fabricate hinges to template screw locations.
- I. All geared hinges to be heavy-gauge aluminum alloy with solid support blocks of self-lubricating DELRIN.
- J. All geared hinges to meet Dynamic and static load test for compliance with ANSI A156.1, (BHMA) for 350,000 cycles at 15 cycles per minute.

- K. Fasteners: Comply with the following:
1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
 2. Wood Screws: For wood doors and frames.
 3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
 4. Screws: Phillips flat-head screws; machine screws drilled and tapped holes for metal doors, wood screws for wood doors and frames. Finish screw heads to match surface of hinges.

2.3 LOCKS AND LATCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Mechanical Locks and Latches:
 - a. Best Lock Corporation, City of Philadelphia Standard, No Substitution
- B. Standards: Comply with the following:
1. Bored Locks and Latches: BHMA A156.2.
 2. Mortise Locks and Latches: BHMA A156.13.
- C. Bored Locks: ANSI A156.2, BHMA Series 4000, Grade 1, and is UL Listed.
- D. Certified Products: Provide door hardware listed in the following BHMA directories:
1. Mechanical Locks and Latches: BHMA's "Directory of Certified Locks & Latches."
- E. Lock Trim: Comply with the following:
1. Lever: Cylindrical Locks & Latches, Zinc material with a minimum wall thickness of .060
 2. Dummy Trim: Match lever lock trim and escutcheons.
- F. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
1. Bored Locks: BHMA A156.2.
- G. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
1. Bored Locks: Minimum 9/16-inch latch bolt throw.
 2. Deadbolts: Minimum 1-inch bolt throw.
- H. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.
- I. Cylindrical Locks & Latches to have solid shank with no opening for access to keyed lever keeper.

2.4 EXIT DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Precision Hardware, Inc.
- B. Standard: BHMA A156.3.
 - 1. BHMA Grade: Grade 1
- C. Certified Products: Provide exit devices listed in BHMA's "Directory of Certified Exit Devices."
- D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
- E. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.
- F. Warranty: Exit device to have published Five (5) Year Warranty.
- G. Exit device shall be "touch pad" type with a touch pad that shall extend a minimum of one half (1/2) of the door width.
- H. Exit device shall have a one-quarter (1/4) gap between the face of the door and the touch bar channel eliminating the need for shims or cutting away the glass molding.
- I. Exit device lock stile chassis shall be investment cast steel. Stamped steel units will not be accepted. All device latch bolts shall be stainless steel and shall be deadlocking type.
- J. Exit device strikes shall be adjustable type investment cast stainless steel.
- K. Exit device shall include sound reduction dampening for both depression and extension of the touch pad.
- L. Exit device end cap shall be all metal and secured with a bracket that interlocks both at the touch bar channel base and hinge side filler to prevent end cap "peel-back".
- M. All exposed surfaces of the exit device housing shall be no less than 14 gauge brass or bronze; or no less than 16 gauge stainless steel. Aluminum housing type exit devices are not acceptable.
Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 - 1. Operation: Rigid
- N. Outside Trim: Lever, Lever with cylinder, Pull, Pull with cylinder, material and finish to match locksets, unless otherwise indicated.
 - 1. Match design for locksets and latchsets, unless otherwise indicated.

2.5 CYLINDERS AND KEYING

- A. The local Best Access System service center shall furnish new master keys and cores directly to owner. All costs for cores, keys and master keying for this project are part of this bid package. All costs to install cores after construction if required are part of this bid package with hardware supplier installing cores on site. All costs for on site owner training (minimum 8-hours) if required by owner is included in this bid package.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cylinders:
 - a. Best Lock Corporation, City of Philadelphia Standard, No Substitution
 - b. All cylinders shall be Best Patented Cormax, 7-pin interchangeable cores.
- C. Standards: Comply with the following:
 - 1. Cylinders: BHMA A156.5.
- D. Cylinder Grade: BHMA Grade 1, Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
 - 1. Number of Pins: Seven.
 - 2. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
 - 3. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 4. Bored-Lock Type: Cylinders with tailpieces to suit locks.
- E. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
 - 1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's locksets.
- F. Construction Keying: Comply with the following:
 - 1. Construction Cores: Provide Brass construction cores in all locksets and cylinders that are replaceable by permanent cores.
 - a. Replace Brass construction cores with permanent cores, as indicated in keying schedule
- G. Keying System: Unless otherwise indicated, provide a factory-registered keying system complying with the following requirements:
 - 1. No Master Key System: Cylinders are operated by change keys only.
 - 2. Master Key System: Cylinders are operated by a change key and a master key.
 - 3. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.
 - 4. Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
 - 5. Existing System: Master key or grand master key locks to Owner's existing system.
 - 6. Keyed Alike: Key all cylinders to the same change key.

- H. Keys: Provide nickel-silver keys complying with the following:
1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: **"DO NOT DUPLICATE."**
 2. Quantity: In addition to one extra blank key for each lock, provide the following:
 - a. Cylinder Change Keys: Three.
 - b. Master Keys: Five.
 - c. Grand Master Keys: Five.
 - d. Great-Grand Master Keys: Five.
 - e. Control Keys: Five
 - f. Construction Master Keys: Ten
 - g. Construction Core Control Keys: Five

2.6 STRIKES

- A. Standards: Comply with the following:
1. Strikes for Bored Locks and Latches: BHMA A156.2.
 2. Strikes for Auxiliary Deadlocks: BHMA A156.5.
- B. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latch bolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

2.7 CLOSERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Surface-Mounted Closers:
 - a. Stanley Commercial Hardware
- B. Standards: Comply with the following:
1. Closers: BHMA A156.4.
- C. Surface Closers: BHMA Grade 1
- D. Certified Products: Provide door closers listed in BHMA's "Directory of Certified Door Closers."
- E. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.8 PROTECTIVE TRIM UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Metal Protective Trim Units:
 - a. Burns Manufacturing Company, Inc.
 - b. Triangle Brass Manufacturing Company, Inc.
- B. Standard: Comply with BHMA A156.6.
- C. Materials: Fabricate protection plates from the following:
 - 1. Stainless Steel: 0.050 inch (1.3 mm) thick; beveled 4 sides.
- D. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine or self-tapping screws.
- E. Furnish protection plates sized 2" less than door width on push side and 1" less than door width on pull side, by height specified in Door Hardware Schedule.

2.9 STOPS AND HOLDERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Architectural Builders Hardware Mfg., Inc.
 - 2. Triangle Brass Manufacturing Company, Inc.
- B. Standards: Comply with the following:
 - 1. Stops and Bumpers: BHMA A156.16.
 - 2. Mechanical Door Holders: BHMA A156.16.
 - 3. Electromagnetic Door Holders: BHMA A156.15.
 - 4. Combination Overhead Holders and Stops: BHMA A156.8.
 - 5. Door Silencers: BHMA A156.16.
- C. Stops and Bumpers: BHMA Grade 1
- D. Mechanical Door Holders: BHMA Grade 1
- E. Combination Overhead Stops and Holders: BHMA Grade 1
- F. Electromagnetic Door Holders for Labeled Fire Door Assemblies: Coordinate with fire detectors and interface with fire alarm system.
- G. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

2.10 DOOR GASKETING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

PROJECT No. 14-18-4745-01
Health Care Center #10 – Interior and Exterior Improvements
087110-11
DOOR HARDWARE

1. Door Gasketing:
 - a. Reese Manufacturing Co., Inc.
 - b. National Guard Products, Inc.
 2. Door Bottoms:
 - a. Reese Manufacturing Co., Inc.
 - b. National Guard Products
- B. Standard: Comply with BHMA A156.22.
- C. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
 3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- D. Air Leakage: Not to exceed **0.50 cfm per foot (0.000774 cu. m/s per m)** of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.
- E. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke- control ratings indicated, based on testing according to UL 1784.
1. Provide smoke-labeled gasketing on 20-minute-rated doors and on smoke-labeled doors.
- F. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL 10B or NFPA 252.
- G. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
- H. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- I. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702.

2.11 THRESHOLDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Reese Manufacturing Co., Inc.
 2. National Guard Products, Inc.
- B. Standard: Comply with BHMA A156.21.

2.12 FABRICATION

- A. Manufacturer's Nameplate: Do not provide manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise approved by Architect.
1. Manufacturer's identification will be permitted on rim of lock cylinders only.

- B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 - 2. Steel Machine or Wood Screws: For the following fire-rated applications:
 - a. Mortise hinges to doors.
 - b. Strike plates to frames.
 - c. Closers to doors and frames.
 - 3. Steel Through Bolts: For the following fire-rated applications, unless door blocking is provided:
 - a. Surface hinges to doors.
 - b. Closers to doors and frames.
 - c. Surface-mounted exit devices.
 - 4. Spacers or Sex Bolts: For through bolting of hollow metal doors.
 - 5. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.13 FINISHES

- A. Standard: Comply with BHMA A156.18.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. BHMA Designations: Comply with base material and finish requirements indicated by the following:
 - 1. BHMA 600: Primed for painting, over steel base metal.
 - 2. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
 - 3. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
 - 4. BHMA 630: Satin stainless steel, over stainless steel base metal.
 - 5. BHMA 652: Satin chromium plated over nickel, over steel base metal.
 - 6. BHMA 689: Aluminum painted, over any base metal.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Steel Doors and Frames: Comply with DHI A115 series.
- B. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107. Wood Doors: Comply with DHI A115-W series.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Key Control System: Place keys on markers and hooks in key control system cabinet, as determined by final keying schedule. Supply key cabinet with 25% expansion. Factory install keys in cabinet or in field with owner's representative. Key cabinet to be supplied with a "Complete System" equal to the Telkee System.
- D. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings, in equipment room. Verify location with Architect.
 - 1. Configuration: Provide one power supply for each door opening.

2. Configuration: Provide the least number of power supplies required to adequately serve doors with electrified door hardware.
- E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section 079200 "Joint Sealants."

3.4 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: Owner or Architect will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 3. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
 2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
 3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

3.8 DOOR HARDWARE SCHEDULE – See Drawing A1.2 for Door Hardware Schedule.

END OF SECTION



SECTION 088000

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass for windows, doors, storefront framing, and glazed curtain walls.
2. Monolithic acrylic plastic glazing for interior skylights.
3. Glazing sealants and accessories.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- ###### A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- ###### A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- ###### B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- ###### C. IBC: International Building Code.
- ###### D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- ###### A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 PREINSTALLATION MEETINGS

- ###### A. Pre-installation Conference: Conduct conference at Project site.
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 2. Review temporary protection requirements for glazing during and after installation.

1.6 ACTION SUBMITTALS

- ###### A. Product Data: For each type of product.
- ###### B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.

- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer glass testing agency and sealant testing agency.
- B. Product Certificates: For glass.
- C. Product Test Reports: For insulating glass and glazing sealants, for tests performed by a qualified testing agency.
 - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Preconstruction adhesion and compatibility test report.
- E. Sample Warranties: For special warranties.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- B. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- C. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.9 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
 - 1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
 - 2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 - 3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
 - 4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
 - 5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.11 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.12 WARRANTY

- A. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
- B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer to design glazing.

- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
 - 1. Design Wind Pressures: As indicated on Drawings.
 - 2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
 - 3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- E. Fire-Test-Response Characteristics of Plastic Glazing: As determined by testing plastic glazing by a qualified testing agency acceptable to authorities having jurisdiction.
 - 1. Self-ignition temperature of 650 deg F (343 deg C) or higher when tested according to ASTM D 1929 on plastic sheets in thicknesses indicated for the Work.
 - 2. Smoke-developed index of 450 or less when tested according to ASTM E 84, or smoke density of 75 or less when tested according to ASTM D 2843 on plastic sheets in thicknesses indicated for the Work.
 - 3. Burning extent of 1 inch (25 mm) or less when tested according to ASTM D 635 at a nominal thickness of 0.060 inch (1.52 mm) or thickness indicated for the Work.
 - 4. Flame-spread index not less than that indicated when tested according to ASTM E 84.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
 - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.

- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 - 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 - 2. Spacer: Aluminum with mill or clear anodic finish.
 - 3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.6 MONOLITHIC ACRYLIC GLAZING

- A. Plastic Glazing: Transparent acrylic sheet; ASTM D 4802, Category A-1 (cell cast), Category A-2 (continuously cast), or Category B-1 (continuously manufactured), Finish 1 (smooth or polished), Type UVF (UV filtering).
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Altuglas International, Division of Arkema Inc.; Plexiglas G or Plexiglas MC.
 - b. Cyro Industries, a subsidiary of Degussa Corporation; Acrylite GP.
 - c. Lucite International; Lucite L.
 - 2. Nominal Thickness: 0.236 inch (6 mm).
 - 3. Color: Colorless.
 - 4. Combustibility Class: CC2.
 - 5. Provide safety glazing labeling.

2.7 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

2.8 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

- ### A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- ### B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- ### C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- ### D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- ### E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.10 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
 - 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep systems.
 - 3. Minimum required face and edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant unless otherwise indicated.

- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape unless otherwise indicated.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 GLASS SCHEDULE

- A. Glass for Single-Glazed Entrance Doors: Clear fully tempered float glass.
 1. Minimum Thickness: 6 mm.
 2. Safety glazing required.
- B. Typical Exterior Insulating Glass: Low-E-coated, clear insulating glass.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide PPG Industries, Inc.; Solarban 70XL, or one of the following:
 - a. Oldcastle BuildingEnvelope; Sunglass.
 - b. Guardian Industries; SunGuard.
 - c. Pilkington North America Inc.; Energy Advantage.
 2. Overall Unit Thickness: 1 inch (25 mm).
 3. Minimum Thickness of Each Glass Lite: 6 mm.
 4. Outdoor Lite: Annealed float glass, unless otherwise indicated.
 - a. Provide heat-strengthened float glass as needed to comply with performance requirements.
 - b. Where safety glass is indicated or required, provide fully tempered float glass.
 5. Interspace Content: Argon.
 6. Indoor Lite: Annealed float glass, unless otherwise indicated.
 - a. Provide heat-strengthened float glass as needed to comply with performance requirements.
 - b. Where safety glass is indicated or required, provide fully tempered float glass.
 7. Low-E Coating: Manufacturer's standard neutral low-E product on second or third surface.
 8. Visible Light Transmittance: 64 percent minimum.
 9. Winter Nighttime U-Factor: 0.28 maximum.
 10. Summer Daytime U-Factor: 0.26 maximum.
 11. Solar Heat Gain Coefficient: 0.27 maximum.
 12. Light-to-Solar-Gain Ratio: LSG 2.37.

END OF SECTION



NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 DEFINITION

- A. Equivalent Gauge Thickness Steel Studs and Runners: Framing members tested in combination with gypsum board to demonstrate compliance with ICC-ES AC86, that do not otherwise comply with minimum thickness or section properties contained in ASTM C 645.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For equivalent gauge thickness steel studs and runners, from ICC-

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 2. Protective Coating: Comply with ASTM C 645; coating with equivalent corrosion resistance of ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized unless otherwise indicated.

- B. Studs and Runners: ASTM C 645. Use either steel studs and runners or equivalent gauge thickness steel studs and runners.
1. Steel Studs and Runners:
 - a. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm), 20 gage.
 - b. Depth: 3-5/8 inches (92 mm). Unless otherwise indicated.
 2. Equivalent Gauge Thickness Steel Studs and Runners:
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems, ProSTUD, or approved comparable products.
 - b. Minimum Base-Metal Thickness: 0.019 inch (0.48 mm), 20 gage equivalent.
 - c. Depth: 3-5/8 inches (92 mm). Unless otherwise indicated.
- C. Slip-Type Head Joints: Provide the following:
1. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) ClarkDietrich Building Systems.
 - 2) MBA Building Supplies.
 - 3) Steel Network Inc. (The).
 - 4) Superior Metal Trim.
 - 5) Telling Industries.
- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm), 20 gage.
- E. Cold-Rolled Channel Bridging: Steel, 0.053-inch (1.34-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: 1-1/2 inches (38 mm), unless otherwise indicated.
 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.
- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm), 20 gage.
 2. Depth: 7/8 inch (22.2 mm), unless otherwise indicated.
- G. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
1. Configuration: Asymmetrical or hat shaped.

- H. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: 3/4 inch (19 mm), unless otherwise indicated.
 - 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch (0.8 mm).
 - 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch (1.59- mm) diameter wire, or double strand of 0.048-inch (1.21-mm) diameter wire.
- I. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 3/4 inch or 7/8 inch (19 or 22 mm), minimum uncoated-metal thickness of 0.018 inch (0.45 mm), and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch (4.12 mm) in diameter.
- C. Flat Hangers: Steel sheet, 1 by 3/16 inch (25 by 5 mm) by length indicated.
- D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch (1.34 mm) and minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: 2-1/2 inches (64 mm), unless otherwise indicated.
- E. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges, 3/4 inch (19 mm) deep.
 - 2. Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm), 20 gage.
 - b. Depth: 3-5/8 inches (92 mm), unless otherwise indicated.
 - 3. Equivalent Gauge Thickness Steel Studs and Runners: ASTM C 645.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems, ProSTUD, or approved comparable products.
 - b. Minimum Base-Metal Thickness: 0.019 inch (0.48 mm), 20 gage equivalent.
 - c. Depth: 3-5/8 inches (92 mm), unless otherwise indicated.
 - 4. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22 mm) deep.
 - a. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm), 20 gage.
- F. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; Drywall Grid System.
 - c. USG Corporation; Drywall Suspension System.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), non-perforated.
 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 - 4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- F. Z-Furring Members:
 - 1. Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.
 - 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
 - 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.
- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.4 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Hangers: 48 inches (1219 mm) o.c.
 2. Carrying Channels (Main Runners): 48 inches (1219 mm) o.c.
 3. Furring Channels (Furring Members): 16 inches (406 mm) o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 5. Do not attach hangers to steel roof deck.
 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION



SECTION 092900

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: 2.3 – Interior gypsum board.
- B. Related Requirements:
 - 1. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

- A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Install mockups for each level of gypsum board finish indicated for use in exposed locations.
 - 2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
 - 3. Simulate finished lighting conditions for review of mockups.
 - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CertainTeed Corp.
 - 2. Georgia-Pacific Gypsum LLC.
 - 3. Lafarge North America Inc.
 - 4. National Gypsum Company.
 - 5. Temple-Inland.
 - 6. USG Corporation.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch (15.9 mm).
 - 2. Long Edges: Tapered.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, or paper-faced galvanized steel sheet.
 - 2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. Expansion (control) joint.

- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fry Reglet Corp.
 - b. Gordon, Inc.
 - c. Pittcon Industries.
 - 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
 - 3. Finish: Class II clear anodic finish.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape for Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use setting-type, sandable topping compound or drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound or drying-type, all-purpose compound.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 - 1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
- D. Sound Attenuation Blankets: As specified in Section 072100 "Thermal Insulation."

E. Acoustical Joint Sealant: As specified in Section 079200 "Joint Sealants."

F. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: Vertical and horizontal surfaces unless otherwise indicated.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
 - 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. LC-Bead: Use at exposed panel edges.
- D. Aluminum Trim: Install in locations indicated on Drawings.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION



ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Acoustical panels and exposed suspension systems for ceilings

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For components with factory-applied color finishes.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of 6-inch (150-mm) square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch- (150-mm-) long Samples of each type, finish, and color.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Suspended ceiling components.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Size and location of initial access modules for acoustical panels.
 - 4. Items penetrating finished ceiling including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.
 - 5. Perimeter moldings.
- B. Qualification Data: For testing agency.

- C. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Panels: Full-size panels equal to 2 percent of quantity installed.
 - 2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to NVLAP for testing indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL PANELS, GENERAL

A. Source Limitations:

1. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
2. Suspension System: Obtain each type from single source from single manufacturer.
 - a. Obtain suspension system from same manufacturer as acoustical ceiling panels if ceiling units specified will fit only the same manufacturer's suspension system.

B. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.

C. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.

D. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

2.3 ACOUSTICAL PANELS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc.; OPTIMA Tegular, Item No. 3250, or comparable product by one of the following:

1. CertainTeed Corp.
2. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:

1. Type and Form: Type XII, glass-fiber base with membrane-faced overlay; Form 2, cloth.
2. Pattern: E (lightly textured).
3. Face: Acoustically transparent membrane.

C. Panel Characteristics:

1. Color: White.
2. LR: 0.90.
3. NRC: 95, Type E-400 mounting according to ASTM E 795.
4. Edge/Joint Detail: Square tegular.
5. Thickness: 1 inch (25 mm).
6. Modular Size: 24 by 24 inches (610 by 610 mm).

2.4 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
- B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Type: Postinstalled expansion or postinstalled bonded anchors.
 - b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
 - 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.
- D. Hanger Rods and Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.
- F. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.
- G. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

- H. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.

2.5 METAL SUSPENSION SYSTEM

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc.; Prelude ML, or comparable product by one of the following:
 - 1. CertainTeed Corp.
 - 2. USG Interiors, Inc.; Subsidiary of USG Corporation.
- B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; pre-painted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.
 - 1. Structural Classification: Heavy-duty system.
 - 2. Face Design: Flat, flush.
 - 3. Cap Material: Aluminum cold-rolled sheet.
 - 4. Cap Finish: Painted white.
- C. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

2.6 METAL EDGE MOLDINGS AND TRIM

- A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
 - 1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
 - 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.7 ACOUSTICAL SEALANT

- A. Acoustical Sealant: As specified in Section 079200 "Joint Sealants."

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post-installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 8. Do not attach hangers to steel deck tabs.
 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 10. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 2. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION



RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient stair accessories.
 - 3. Resilient molding accessories.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches (300 mm) long.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.

- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL BASE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Johnsonite; A Tarkett Company.
 - 3. Roppe Corporation, USA.
- B. Product Standard: ASTM F 1861, Type TV (vinyl, thermoplastic).
 - 1. Group: I (solid, homogeneous).
 - 2. Style: Style B, cove.
- C. Minimum Thickness: 0.125 inch (3.2 mm).
- D. Height: 4 inches (102 mm).
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Colors and Patterns: As selected by Architect from full range of industry colors.
- I. Applications: Provide vinyl base for resilient base locations unless otherwise indicated.

2.2 RUBBER BASE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Johnsonite; A Tarkett Company.
 - 3. Roppe Corporation, USA.
- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset) or Type TP (rubber, thermoplastic), Group I (solid, homogeneous).
 - 1. Style: Style A, straight.
- C. Thickness: 0.125 inch (3.2 mm).

- D. Height: 4 inches (102 mm).
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Colors: As selected by Architect from full range of industry colors.
- I. Applications: Provide rubber base at check-in desk.

2.3 RUBBER STAIR ACCESSORIES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Johnsonite, Inc.; Resilient Rubber Stair Treads, Model VIRTRS-SQ, or comparable product by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Roppe Corporation, USA.
- B. Stair Treads: ASTM F 2169.
 - 1. Type: TS (rubber, vulcanized thermoset).
 - 2. Class: 2 (pattern; embossed).
 - 3. Group: 2 (with contrasting color for the visually impaired).
 - 4. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees.
 - 5. Nosing Height: 2 inches (51 mm).
 - 6. Thickness: 1/4 inch (6 mm) and tapered to back edge.
 - 7. Size: Lengths and depths to fit each stair tread in one piece.
 - 8. Integral Risers: Smooth, flat; in height that fully covers substrate.
- C. Landing Tile: Matching treads; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.
- D. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.4 VINYL MOLDING ACCESSORY

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Johnsonite; A Tarkett Company.
 - 3. Roppe Corporation, USA.
- B. Description: Vinyl reducer strip for resilient flooring and transition strips.
- C. Colors and Patterns: As selected by Architect from full range of industry colors.

2.5 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less.
- C. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.

- b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until they are the same temperature as the space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
 - a. Miter or cope corners to minimize open joints.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.

- B. Resilient Stair Accessories:
 - 1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
 - 2. Tightly adhere to substrates throughout length of each piece.
- C. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION



SECTION 096516

RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Vinyl sheet flooring with wood-grain pattern and factory-applied finish.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of flooring. Include flooring layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
- C. Samples for Initial Selection: For each type of resilient sheet flooring indicated.
- D. Samples for Verification: In manufacturer's standard size, but not less than 6-by-9-inch (150- by-230-mm) sections of each different color and pattern of resilient sheet flooring required.
 - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches (230 mm) long, of each color required.
- E. Welded-Seam Samples: For seamless-installation technique indicated and for each resilient sheet flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch (150-by-230-mm) Sample applied to a rigid backing and prepared by Installer for this Project.
- F. Product Schedule: For resilient sheet flooring. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Resilient Sheet Flooring: Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, in roll form and in full roll width for each type, color, and pattern of flooring installed.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Build mockups for resilient sheet flooring including resilient base and accessories.
 - a. Size: Minimum 100 sq. ft. (9.3 sq. m) for each type, color and pattern in locations indicated, or of not indicated, in locations directed by Architect.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store rolls upright.

1.9 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive resilient sheet flooring during the following time periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during resilient sheet flooring installation.
- D. Close spaces to traffic for 48 hours after resilient sheet flooring installation.
- E. Install resilient sheet flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient sheet flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 V-1 AND V-2 VINYL SHEET FLOORING WITH BACKING

- A. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Armstrong World Industries, Inc; REJUVENATIONS TimberLine.
 - 2. Lonseal, Inc; LONWOOD DAKOTA Topseal.
- B. Product Standard: ASTM F 1303.
 - 1. Type (Binder Content): Type I, minimum binder content of 90 percent.
 - 2. Wear-Layer Thickness: Grade 1.
 - 3. Overall Thickness: 0.080 inch (2.0 mm).
 - 4. Backing Class: Class A (fibrous) or Class B (nonfoamed plastic).
- C. Wearing Surface: Embossed; slightly textured with wood-grain pattern.
- D. Factory-Applied Finish: Clear, UV-resistant and microbial-resistant urethane topcoat.
- E. Sheet Width: 6 feet (1.8 m).
- F. Seamless-Installation Method: Heat welded.
- G. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less.
- C. Seamless-Installation Accessories:
 - 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
 - a. Color: Match flooring.
- D. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient sheet flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to resilient sheet flooring manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient sheet flooring until it is the same temperature as the space where it is to be installed.
 - 1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

3.3 RESILIENT SHEET FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
- B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.
- C. Lay out resilient sheet flooring as follows:
 - 1. Maintain uniformity of flooring direction.
 - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in flooring substrates.
 - 3. Match edges of flooring for color shading at seams.
 - 4. Avoid cross seams.
- D. Mix resilient sheets from several packages to achieve a uniformly random distribution of color variation in flooring installation.
- E. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- F. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.
- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- H. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.
- I. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- J. Seamless Installation:
 - 1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless flooring. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.
- B. Perform the following operations immediately after completing resilient sheet flooring installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.

- C. Floor Polish: Remove soil, adhesive, and blemishes from flooring surfaces before applying liquid floor polish.
 - 1. Apply two coats.
- D. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- E. Cover resilient sheet flooring until Substantial Completion.

END OF SECTION

SECTION 096519



RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vinyl composition floor tile
2. Resilient terrazzo floor tile.

B. Related Requirements:

1. Section 096513 "Resilient Base and Accessories" for resilient base, reducer strips, and other accessories installed with resilient floor coverings.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For each type of floor tile indicated.
- C. Samples for Verification: Full-size units of each color and pattern of floor tile required.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockups for floor tile including resilient base and accessories.

- a. Size: Minimum 100 sq. ft. (9.3 sq. m) for each type, color, and pattern in locations directed by Architect.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL COMPOSITION FLOOR TILE VCT-1, VCT-2, VCT-3, VCT-4, VCT-5

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc; Imperial Texture Standard Excelon, or comparable products by one of the following:
 1. Congoleum Corporation.
 2. Mannington Mills, Inc.
 3. Tarkett, Inc.
- B. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
- C. Wearing Surface: Smooth.
- D. Thickness: 0.125 inch (3.2 mm).
- E. Size: 12 by 12 inches (305 by 305 mm).

- F. Colors and Patterns: As selected by Architect from full range of industry colors to match color and pattern of existing floor tile.

2.2 RESILIENT TERRAZZO FLOOR TILE

- A. Resilient Terrazzo Floor Tile: Marble or granite chips embedded in flexible, thermoset-polyester-resin matrix; electrically nonconductive and chemical, oil, and corrosion resistive, with smooth wearing surface and manufacturer's standard factory-applied, protective urethane coating.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Expanko, Inc., Exton PA (fritztile.com); Fritztile, CL 200 Classic.
- B. Thickness: 3/16 inch (4.8 mm).
- C. Nominal Size: 12 by 12 inches (305 by 305 mm).
- D. Performance Characteristics:
 - 1. Compressive Strength: 2900 to 5000 psi (20 to 34.5 MPa), ASTM C 109/C 109M or ASTM D 695.
 - 2. Abrasion Resistance: Maximum 0.0196-cu. cm volume loss, ASTM F 510, Taber abrader, S-39 wheels, at 500 cycles with 1000-gram load.
 - 3. Static Load Limit: 0.0007-inch (0.0177-mm) maximum indentation, ASTM F 970 at 125 lb (57 kg).
 - 4. Resin Matrix Hardness: Not less than 78, as measured using Shore, Type D durometer per ASTM D 2240.
- E. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
 - 1. Adhesives shall comply with the following limits for VOC content:
 - a. Vinyl Composition Tile Adhesives: 50 g/L or less.
 - b. Terrazzo Floor Tile Adhesives: 65 g/L or less.
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.
- D. Joint Sealant for Resilient Terrazzo Floor Tile: Silicone sealant of type and grade recommended in writing by floor tile manufacturer to suit resilient terrazzo floor tile.
 - 1. Sealant shall have a VOC content of 250 g/L or less.

2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match floor tile.
- E. Sealers and Finish Coats for Resilient Terrazzo Floor Tile: Products recommended by floor tile manufacturer for resilient terrazzo floor tile.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain running in one direction or with grain direction alternating in adjacent tiles (basket-weave pattern), as directed by Architect.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
 - 1. Apply three coats.
- E. Joint Sealant: Apply sealant to resilient terrazzo floor tile perimeter and around columns, at door frames, and at other joints and penetrations.
- F. Sealers and Finish Coats: Remove soil, visible adhesive, and surface blemishes from resilient terrazzo floor tile surfaces before applying liquid cleaners, sealers, and finish products.
 - 1. Sealer: Apply two base coats of liquid sealer.
 - 2. Finish: Apply three coats of liquid floor finish.
- G. Cover floor tile until Substantial Completion.

END OF SECTION



SECTION 099000

PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Surface preparation and the application of paint systems on exterior and interior substrates including repainting at areas of renovation.
- B. Paint exposed exterior and interior substrates of new construction, except where schedules indicate that a surface or material is not to be painted or is to remain natural. If schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.
 - 1. Repaint surfaces that are damaged or soiled by construction operations to match existing paint, so there is no evidence of patching in the completed Work.
 - 2. Do not paint prefinished items, integrally finished systems, finished metal surfaces, operating parts, and labels, unless otherwise indicated.
 - 3. Prefinished items include the following shop- or factory-finished components:
 - a. Architectural woodwork and casework.
 - b. Finished mechanical and electrical equipment.
 - c. Lighting fixtures.
 - 4. Finished metal surfaces include the following:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper.
 - e. Bronze and brass.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements, and Division 1 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 5 (Semi-Gloss): 35 to 70 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat; cured not less than 7 days.
 - 1. Submit Samples on rigid backing, 12 inches (300 mm) square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Provide adequate ventilation, including mechanical ventilation, to remove paint odors and fumes from areas of the building where odors might migrate to occupied spaces.

PART 2 - PRODUCTS

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PAINTING AND COATING

2.1 MANUFACTURERS

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Benjamin Moore & Co.
2. M.A.B. Paints.
3. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Quality: Unless otherwise indicated, provide manufacturer's best-quality paint material for each coating type.
- C. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- D. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.
- E. Colors: As selected by Architect from manufacturer's full range.

2.3 PRIMERS/SEALERS

- A. Primer Sealer, Interior, Institutional Low Odor/VOC: MPI #149.
- B. Primer, Latex, for Interior Wood: MPI #39.

2.4 METAL PRIMERS

- A. Primer, Galvanized, Water Based: As recommended in writing by topcoat manufacturer.
- B. Primer, Rust-Inhibitive, Water Based: MPI #107.

2.5 EXTERIOR WATER-BASED PAINTS

- A. Light Industrial Coating, Exterior, Water Based, Semi-Gloss (Gloss Level 5): MPI #163.

2.6 INTERIOR WATER-BASED PAINTS

- A. Latex, Interior, Institutional Low Odor/VOC (Gloss Level 3): MPI #145.
- B. Latex, Interior, Institutional Low Odor/VOC, Semi-Gloss (Gloss Level 5): MPI #147.

2.7 STAINS

- A. Stain, Semi-Transparent, for Interior Wood: MPI #90.

2.8 WATER-BASED VARNISHES

- 1. Varnish, Water Based, Clear, Satin (Gloss Level 4): MPI #128

2.9 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Wood: 15 percent.
 - 2. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are

not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

- C. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- G. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 - 4. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view on exterior:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.
 - e. Plastic conduit.
 - 2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Galvanized-Metal Substrates:

1. Water-Based Light Industrial Coating System:

- a. Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized-metal substrates with topcoat indicated.
- b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
- c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (Gloss Level 5), MPI #163.

3.7 INTERIOR PAINTING SCHEDULE

A. Steel Substrates:

1. Institutional Low-Odor/VOC Latex System:

- a. Prime Coat: Primer, rust-inhibitive, water based MPI #107.
- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5), MPI #147.

B. Wood Substrates for Painted Finish:

1. Institutional Low-Odor/VOC Latex System:

- a. Prime Coat: Primer, latex, for interior wood, MPI #39.
- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5), MPI #147.

C. Wood Trim Substrates for Stained Finish:

1. Water-Based Varnish over Stain System:

- a. Stain Coat: Stain, semi-transparent, for interior wood, MPI #90.
- b. First Intermediate Coat: Water-based varnish matching topcoat.
- c. Second Intermediate Coat: Water-based varnish matching topcoat.
- d. Topcoat: Varnish, water based, clear, satin (Gloss Level 4), MPI #128.

D. Gypsum Board and Plaster Substrates:

1. Institutional Low-Odor/VOC Latex System:

- a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
- b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
- c. Topcoat: Latex, interior, institutional low odor/VOC, eggshell (Gloss Level 3), MPI #145.

END OF SECTION