DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT DOCUMENTS

FOR

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

March 2022

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * * * * *

TABLE OF CONTENTS

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * * * * *

March 16, 2022

ADVERTISEMENT FOR BIDS

Sealed Bids for the above project will be accepted during normal business hours by the Delaware River and Bay Authority ("DRBA" or the "Authority") Procurement Department, located at the intersection of I-295 & New Castle Avenue (DE Route 9), Administration Building #6, New Castle, Delaware, 19720, until 11:00 a.m. local time on April 26, 2022, at which time and place said Bids will be opened.

The project is located at the Cape May Terminal Police Dispatch Center located within the Cape May Police and Administration Building. The project work consists of demolition of existing and installation of new architectural, electrical, plumbing & mechanical systems (including appurtenances), and associated architectural renovations. The Contractor will be required to coordinate with Authority trades and contractors for specialized network equipment, fire alarm systems, and with the video wall visualization system vendor.

All work on the project must be completed within One Hundred and Ninety-Five (195) calendar days after the start date listed on the "Notice to Proceed" correspondence issued by the Authority. It is the intent of the Authority to authorize the Contractor to proceed with the work on or about September 1, 2022. **TIME IS OF THE ESSENCE.**

A non-mandatory pre-bid meeting and site visit will be held on March 31, 2022, at 11:00 a.m. local time at the Cape May Ferry Administration Building, 1200 Lincoln Blvd., North Cape May, New Jersey 08204. All visitors must check-in with the DRBA Police Department at Building C-2 to obtain a Visitor I.D. badge and must wait at the Administration Building entrance area for further instructions from DRBA staff. All visitors must follow the personal protective equipment requirements in accordance with DRBA policy. Unsupervised access to the project site is prohibited.

ELECTRONIC AND MAILED BIDDING IS STRONGLY ENCOURAGED. Bidders are encouraged to mail any hardcopy bid documents required by the Authority in advance and to use CapEx to submit their numeric bid electronically. Bidders may enter, revise, and resubmit electronic bids up until bids are due.

NOTE: For those who intend to deliver Bid Documents in-person, DRBA Administration Building #6, located at the intersection of I-295 & New Castle Avenue (DE Route 9), New Castle, Delaware, 19720, is currently open to the public during normal business days from 8:30 A.M. to 4:30 P.M.

Bids received after the due date and time will not be considered. The DRBA reserves the right to reject any or all bids or portions thereof, and to waive irregularities.

Bidders may obtain contract documents from CapEx Manager ("CapEx"), the Authority's online project management system. A link to CapEx is available at www.drba.net by clicking the "Procurement" link, then the link labeled "See Open Projects".

Bidders may choose to submit the numeric portion of the bid electronically via CapEx or may incorporate a hard copy of the numeric portion of the bid. In addition to the numeric portion of the bid (whether submitted electronically or via hard copy), all bidders must submit the applicable approved bid forms identified within the Contract Documents. Bidders must complete and submit the "Qualification Questionnaire" form on behalf of themselves and for any subcontractor intended to perform twenty percent (20%) or more of the total value of the work.

Each bid must be accompanied by a Bid Bond, on the form furnished by the Authority and included in the Contract Documents, for a sum of not less than ten percent (10%) of the total price bid.

Bidders must be registered as a vendor and subscribe to this project in CapEx in order to be eligible to submit a bid. If a bidder has the ability to submit a bid under more than one company name, the company that actually submits the bid must be registered as a bidder in CapEx. If submitting a bid as a joint venture, the joint venture must be registered in CapEx and subscribed to this project. Bids submitted by firms who have not registered the bidding company name as a vendor or who have not subscribed to this project in CapEx will be rejected.

All questions concerning the plans or specifications must be forwarded to the Authority in writing via CapEx. Questions must be received by 11:00 a.m. local time, not later than six (6) business days prior to the bid opening date. The Authority has no obligation to answer any question received after the above-stated time. Questions and corresponding answers will be included as Contract Addenda released to all subscribed parties.

Bidders must submit their bid (other than the numeric portion of the bid if submitted via CapEx) within a sealed envelope. The envelope containing the bid forms must be marked "Bid for Contract No. CMLF-C19-06, CAPE MAY TERMINAL POLICE DISPATCH CENTER REHABILITATION". If the bidder has submitted its numeric bid via CapEx the envelope shall be marked: "NUMERIC BID SUBMITTED VIA CAPEX".

Together, parts (i) and (ii) below, as modified by any special provision(s) or by documents of any description furnished by the DRBA as part of this project, shall form the "Standard Specifications" and shall govern the execution of the project:

(i) Division 100 – General Provisions of the Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction, dated December 15, 2014; and

(ii) Divisions 200 through 1000 of the Delaware Department of Transportation ("DelDOT") Standard Specifications for Road and Bridge Construction, dated June 2021, including any Standard Items and Special Provisions, as published on the DelDOT website ("DelDOT Standard Specifications").

Any applicable provision set forth in the Standard Specifications, as defined above, that is not modified by or in conflict with the Special Provisions shall be understood to remain in full force and effect.

Registered Bidders who subscribe to this project are provided with, via CapEx, a digital edition of Division 100 – General Provisions of the DRBA's Standard Specifications. To access the DelDOT Standard Specifications, Bidders may visit www.deldot.gov, click the Quick Link labeled "Publications", then scroll down to the section marked "Manuals" and select "Standard Specifications" and lastly select "Standard Specifications – June 2021".

The Authority encourages supplier diversity and the participation of disadvantaged, minority-owned and women-owned firms on all of its projects.

Bidders are advised that, pursuant to DRBA Resolution 15-12, this project is *not* subject to the DRBA's Prevailing Wage Policy.

DELAWARE RIVER AND BAY AUTHORITY

By: James N. Hogan, Chairman
Thomas J. Cook, Executive Director

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * * * * *

BID

To: Delaware River and Bay Authority
I-295 & New Castle Avenue
New Castle, Delaware 19720

Sirs:

The undersigned Bidder has carefully examined the site and location of the proposed work, the proposed form of Contract to be known as Contract No. CMLF-C19-06, Division 100 – General Provisions of the Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction, dated December 15, 2014 and Divisions 200 through 1000 of the Delaware Department of Transportation Standard Specifications for Road and Bridge Construction, dated June 2021, including all Standard Items and Special Provisions, as published on the DelDOT website (together, the "Standard Specifications") and DRBA Special Provisions, and binds himself on award to him by the Delaware River and Bay Authority (herein called "Authority") under this Bid to execute a Contract in accordance with such award, of which Contract this Bid and said Plans, Standard Specifications and Special Provisions shall be part, to provide all necessary machinery, tools, labor, and other means of construction, and to do all work and furnish all materials necessary to perform and complete the requirements of said Authority, at the following named unit and/or lump sum prices for the various scheduled items:

ATTENTION: In accordance with General Provision 102.09 *'Delivery of Bids'*, if you have subscribed to a project and wish to submit a Bid, you may submit the numeric portion of your Bid either: 1) online via CapEx or 2) in hard copy along with all of the other required Bid forms as provided by the Authority. See below instructions:

1) If you choose to submit your numeric Bid online, you must complete the Bid pages using CapEx. Once you have selected the project from the *'Project List'*, you will be redirected to the *'RFB Summary'* page. Near the bottom of the page, under the '*Bid Detail'* section, click the *'Take Bidder Role'* button, which will unlock the *'Bid'* tab at the top of the page. Next, click the *'Bid'* tab and enter your Bid information under the *'Line Items Specified'* section. Note, when submitting a numeric Bid online, the envelope containing the additional required Bid Forms in hard copy shall be marked "NUMERIC BID SUBMITTED VIA CAPEX".

   OR

2) If you choose to submit a hard copy of your numeric Bid, you must print a copy of the Bid pages from CapEx. Once you have selected the project from the *'Project List'*, you will be redirected to the *'RFB Summary'* page. Scroll down to the '*Procurement Detail'* section, and click the link marked *'Proposal Pages'*. This link will open a .pdf of the numeric Bid page(s) for the Bidder to print (one-sided), complete and submit along with all of the other required Bid Forms in hard copy.

Bidders are cautioned to choose only ONE of the numeric Bid submission methods above.
Note that in accordance with the General Provisions, "*if the Bidder has submitted the numerical portion of his, her or its Bid both online and in hard copy format, the hard copy shall supersede the online submission unless the hard copy version has been specifically withdrawn by the Bidder in accordance with Subsection 102.10.*"

This page will be removed and replaced with the awarded Bidder's numeric Bid Page in the final set of executable Contract Documents

NOTE: **All Pay Item fields must be completed or the Bid will be disqualified.** Unless a bid is rejected pursuant to subsection 102.07, or the bidder is disqualified pursuant to subsection 102.12 of the General Provisions of the DRBA Standard Specifications for Road and Bridge Construction, award will be made to the responsible bidder who submits the lowest responsive base bid. If, during the tabulation of bids, the price on any bid is found to be incorrectly computed, the Authority reserves the right to make such corrections in computation as are necessary in the extended amounts and price on the basis of the unit and lump sum prices given and the approximate quantities stated for the scheduled items herein.

Together, parts (i) and (ii) below, as modified by any special provision(s) or by documents of any description furnished by the DRBA as part of this project, shall form the "Standard Specifications" and shall govern the execution of this project:

(i) Division 100 – General Provisions of the Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction, dated December 15, 2014; and

(ii) Divisions 200 through 1000 of the Delaware Department of Transportation ("DelDOT") Standard Specifications for Road and Bridge Construction, dated June 2021, including any Standard Items and Special Provisions, as published on the DelDOT website ("DelDOT Standard Specifications").

Any applicable provision set forth in the Standard Specifications, as defined above, that is not modified by or in conflict with the Special Provisions shall be understood to remain in full force and effect.

Capitalized terms used in these Bid Pages and not otherwise defined shall have the meaning set forth in the Standard Specifications.

Registered Bidders who subscribe to this project are provided with a digital edition of Division 100 – General Provisions of the DRBA's Standard Specifications via CapEx. To access the DelDOT Standard Specifications, Bidders may visit www.deldot.gov, click the Quick Link labeled "Publications", then scroll down to the section marked "Manuals", select "Standard Specifications" and lastly select "Standard Specifications - June 2021".

The cost of any work performed, materials furnished, services provided, or expenses incurred, which are not specifically delineated in the Contract Documents but which are necessary or proper for or incidental to the scope, intent, execution and completion of the Contract, shall be deemed to have been included in the prices bid for each Pay Item.

Each bid must be accompanied by a Bid Bond, on the form furnished by the Authority and included in the Contract Documents, for a sum of not less than ten percent (10%) of the total price bid.

Failure on the part of the Bidder to whom the Contract has been awarded to execute and deliver the Contract Agreement and all other documents listed in Subsection 103.06 in the Standard Specifications and in the manner and within the time prescribed therein shall be just cause for the Authority to annul the Award, to recover under the terms and provisions of the Bid Bond, and to

exclude the Bidder from bidding on subsequent Authority projects for such period as the Authority may deem appropriate.

The provisions of Resolution No. 98-31 Part 2, Subparagraphs (b), (c), (d) and (e) of the Delaware River and Bay Authority govern the procedures for the solicitation and award of this Contract. The above-mentioned Subparagraphs are as follows:

"2. b. All construction management contracts and all construction contracts entered into by the Authority for construction, reconstruction, demolition, alteration, and repair work and maintenance work with any person, partnership, corporation, company association or similar entity or any affiliate thereof, which contract individually exceeds $50,000, shall be pursuant to a contract entered into by the Authority after competitive bidding. The advertisement for such bids shall be published at least once a week for two consecutive weeks in one newspaper of general circulation in each of the states of Delaware and New Jersey. The advertisement shall indicate the character, quantity, and location of the work, the time and place where the plans and specifications or descriptions may be obtained and where proposals are to be received.

c. Any person proposing to bid on such contract may be required by the Authority to complete a questionnaire and file a financial statement containing a complete statement of that person's financial ability and experience in performing such work. If the Authority is not satisfied with the sufficiency of the answers to the questionnaire or the financial statement, it may refuse to furnish the person submitting such unsatisfactory answers or financial statement any request for proposals or any plans or specifications for the work and the bid of any such person may be disregarded.

d. Any person to whom a construction management contract or construction contract is awarded must be bondable in the full amount of the construction contract and any request for proposals disseminated by the Authority for such a contract shall include a copy of the Authority's form of construction contract which shall be part of the proposal to be reviewed by prospective bidders. In addition, with respect to any construction management contract, the construction manager will be required to obtain at least three bids for each subcontractor category (unless it is determined by the Authority not to be in the best interest of the Authority to so require) and no work shall be awarded to any subcontractor without the prior approval of the Authority.

e. All materiel and supply contracts, non-professional service contracts and all construction management contracts or construction contracts are to be awarded to the lowest responsible bidder unless, in the opinion of the Authority or its delegated representative, the interest of the Authority is better served by awarding the contract to another bidder and, in addition, the Authority reserves the right to reject any or all bids, to advertise for new bids, to proceed to do the work otherwise, or to abandon the work if in the judgment of the Authority its best interest will be promoted thereby. In determining how the interest of the Authority is better served in making an award to other than the lowest responsible bidder, the Authority may take into consideration all relevant factors, including, but not limited to (i) the unsatisfactory performances on any previously awarded contracts by the bidder being rejected, (ii) lack of relevant experience on similar projects, (iii) lack of adequate manpower or supervisory staff; (iv) poor track record of timely completion within the industry or for the Authority; (v) track record of requesting unreasonable change orders, (vi) bonding capacity, (vii) low or no percentage of DBE, (viii) past claims or current legal problems or (ix) questionable subcontractor list.

Bidders that have chosen to submit a hard copy of the numeric portion of the bid (as opposed to submitting the bid electronically via CapEx) must acknowledge receipt of all Addenda by listing each Addendum number and date received in the following space. If no Addenda were issued, please write "None":

_____

_____

Acknowledgment is hereby made that the undersigned Bidder has visited the work site, examined the condition of the area to be renovated under the Contract, and correlated personal observations with requirements of the Contract Documents. Failure to visit the work site does not excuse any error or omission contained in the Bid.

Firm Name of Bidder:_____

Address of Bidder: _____

_____

By: _____
(Signature)

By: _____
(Print Name)

Title: _____

Phone Number: _____

(If Corporation, add Corporate Seal)

Witness or Attest:_____ Date: _____

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * * * * *

BREAKOUT SHEET

Bidders are required to breakout (separately identify) the associated labor, material and other costs associated with the Lump Sum prices bid for each of the following Lump Sum Pay Items:

- **Pay Item 1: DIVISION 13: GENERAL ARCHITECTURAL**
- **Pay Item 2: DIVISION 20: GENERAL MECHANICAL/PLUMBING**
- **Pay Item 3: DIVISION 26: GENERAL ELECTRICAL**

This Breakout Sheet must be completed and submitted either with the Bid Documents, or within seven (7) calendar days following the Bid due date, after notification from the Authority, by the apparent low Bidder.

The Breakout Sheet is to be submitted to the Authority's Procurement Department and cannot be changed after preliminary award. The Authority will review the figures submitted on the Breakout Sheet to ensure they exactly match the corresponding lump sum Pay Item totals bid. The Authority reserves the right to return mathematically incorrect Breakout Sheets for immediate correction, or, in the alternative, the nonconforming Bid will be rejected as non-responsive.

PAY ITEM 1: DIVISION 13: GENERAL ARCHITECTURAL, BREAKOUT	
SECTION/DESCRIPTION	**COST**
024110 Demolition	$
042000 Unit Masonry	$
061000 Rough Carpentry	$
064100 Architectural Wood Casework	$
064200 Wood Paneling	$
075300 Elastomeric Membrane Roofing	$
076200 Sheet Metal Flashing and Trim	$
079200 Joint Sealants	$
081213 Hollow Metal Frames	$
081416 Flush Wood Doors	$
088000 Glazing	$

092116 Gypsum Board Assemblies	$
093000 Tiling	$
095100 Acoustical Ceilings	$
096500 Resilient Flooring	$
096813 Tile Carpeting	$
099123 Interior Painting	$
101400 Signage	$
102641 Ballistics Resistant Panels	$
102800 Toilet, Bath and Laundry Accessories	$
123217 Console Furniture	$
TOTAL *(Must Match Lump Sum Bid for Pay Item 1)*	**$**

PAY ITEM 2: DIVISION 20: GENERAL MECHANICAL/PLUMBING, BREAKOUT	
SECTION/DESCRIPTION	**COST**
200000 General Mechanical Requirements	$
210000 Fire Protection	$
220000 General Plumbing Requirements	$
230000 Heating & Air Conditioning	$
TOTAL *(Must Match Lump Sum Bid for Pay Item 2)*	**$**

PAY ITEM 3: DIVISION 26: GENERAL ELECTRICAL, BREAKOUT	
SECTION/DESCRIPTION	**COST**
260000 General Electrical Requirements	$
260500 Electrical Materials and Methods	$
265000 Lighting	$
TOTAL *(Must Match Lump Sum Bid for Pay Item 3)*	**$**

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

BID BOND

We, the undersigned, _____

_____

as principal (herein called the "Principal"), and _____

_____

a _____ of the State of _____, which is legally authorized to do business in the State of New Jersey, where the work is to be performed, as surety (herein called the "Surety"), do hereby agree to be held and bound unto the Delaware River and Bay Authority (herein called the "Authority") for the sum of _____

_____Dollars and _____Cents ($_____), which sum is to be paid to the Authority for its use and benefit. Further, for such payment well and truly to be made, we do hereby bind ourselves and our heirs, executors, administrators, successors, and assigns, jointly and severally.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH that the obligation hereby undertaken shall not vest and become binding unless the Principal, who has submitted to the Authority a bid to enter into Contract No. CMLF-C19-06 for the performance of certain work for the Authority (herein called the "Contract"), shall be awarded the Contract. If the Contract is so awarded, the obligation hereby undertaken shall be and remain in full force and effect until discharged unless the Principal enters into and executes the Contract and furnishes such surety bond and proof of required insurance coverage as may be required by the terms of the Contract Documents and approved by the Authority, all within ten (10) calendar days after the date of official notice of the award thereof in accordance with the terms of the bid for the Contract.

IN WITNESS WHEREOF, the Principal and Surety have duly executed this Bid Bond as of _____, 20__.

[PRINCIPAL]

Name: _____

Address: _____

_____

Witness or Attest:

By: _____

_____
(Corporate Seal)

Title: _____

[SURETY]

Name: _____

Address: _____

_____

Witness or Attest:

By: _____

_____
(Corporate Seal)

Title: _____

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

CONSENT OF SURETY

Delaware River and Bay Authority:

We have reviewed the Bid of _____
(Name of Contractor)

of_____
(Contractor Address)

for Contract No. CMLF-C19-06 and wish to advise that should this Bid of the Contractor be accepted and the Contract awarded to said Contractor, this company agrees to become the surety on the Contract Bond and Maintenance Bond required by the Contract Documents.

We are duly authorized to do business in the state of New Jersey:

Surety Company Name/Address:

_____

_____

_____
(Authorized Signature)

ATTEST:

_____
[Attach Power of Attorney]

(Add Corporate Seal, if any. If no seal, write "No Seal" across this place and sign.)

STOCKHOLDERS AND/OR PARTNERS
OWNING MORE THAN TEN PERCENT OF BIDDING ORGANIZATION

If Bidder is a Corporation or Partnership, this form must be completed and submitted with the Bid. If no stockholder or partner owns ten percent or more of the Bidding organization, place a checkmark in the following box and skip to the signature line below: ☐

List the name and address of each stockholder owning ten percent (10%) or more of any class of corporate stock of the Bidding organization or each individual partner owning ten percent (10%) or greater interest of the Bidding organization:

		PERCENT OF OWNERSHIP
NAME_____	ADDRESS_____	
	_____	_____
NAME_____	ADDRESS_____	
	_____	_____
NAME_____	ADDRESS_____	
	_____	_____

If any stockholder or partner named above is itself a Corporation or Partnership, list the name and address of each stockholder owning ten percent (10%) or more of any class of corporate stock or ten percent (10%) or greater interest of said Corporation or Partnership. The disclosure shall be continued until names and addresses of every non-corporate stockholder, and individual partner, and member, exceeding the 10 percent ownership criteria established in this act, has been listed, using additional sheets as necessary.

		PERCENT OF OWNERSHIP
NAME_____	ADDRESS_____	
	_____	_____
NAME_____	ADDRESS_____	
	_____	_____
NAME_____	ADDRESS_____	
	_____	_____

I certify that the foregoing information is correct.

_____
Signature

_____
Print Name and Title

of

_____
Name of Bidding Organization

(This form must be completed and submitted with the Bid if Bidder is a Corporation or Partnership.)

CERTIFIED CORPORATE RESOLUTION

(CORPORATE BIDDERS ONLY)

RESOLVED, that_____be
(Name of Officer)

authorized to sign and submit the bid of this corporation and be authorized to execute a contract and any other instrument of whatever nature entered into by this corporation for the following project:

DRBA CONTRACT NO. CMLF-C19-06, CAPE MAY TERMINAL POLICE DISPATCH CENTER REHABILITATION.

The foregoing is a true and correct copy of the resolution adopted by _____

_____Corporation at a meeting of its Board of Directors held

on the _____day of _____, 20___.

_____
(Secretary)

_____
(Seal)

(This form must be completed and submitted with the Bid if Bidder is a Corporation)

DELAWARE RIVER AND BAY AUTHORITY

CAPE-MAY LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

NON-COLLUSION AFFIDAVIT

STATE OF _____

COUNTY OF _____

I, _____ of the City

of _____, County of _____ and State of

_____, being of full age and duly sworn according to law on my oath dispose and say:

That I, on behalf of _____, submitted and executed a Bid for Contract No. CMLF-C19-06 to the Delaware River and Bay Authority, with full authority to do so, and that said Bidder has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the said Contract; and that all statements contained in said Bid and in this Affidavit are true and correct and made with full knowledge that the said Authority relies upon the truth of the statements contained in said Bid and in this Affidavit in awarding the said Contract. I further warrant that no person or selling agency has been employed or retained to solicit or secure the said Contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide full-time employees.

By: _____

Sworn to and subscribed before me this _____ day of _____ 20____.

_____
Notary Public

My commission expires _____, 20_____.

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

JOINT VENTURE STATEMENT

STATE OF _____

COUNTY OF _____

We, the undersigned, being duly sworn according to law, upon our respective oaths depose and say that:

1. The following named contractors have entered into a Joint Venture for the purpose of carrying out all the provisions of Contract No. CMLF-C19-06:

(a) _____ ( ) An Individual ( ) A Partnership ( ) A Corporation

(b) _____ ( ) An Individual ( ) A Partnership ( ) A Corporation

(c) _____ ( ) An Individual ( ) A Partnership ( ) A Corporation

2. The contractors, under whose names we have affixed our respective signatures, have duly authorized and empowered us to execute this Joint Venture Statement in the name of and on behalf of such contractors for the purpose hereinabove stated.

3. Under the provisions of such Joint Venture, the assets of each of the contractors named in Paragraph 1 hereof, and in case any contractor so named above is a partnership, the assets of the individual members of such partnership, will be available for the performance of such Joint Venture and liable therefore and for all obligations incurred in connection therewith.

4. The assets and liabilities of the named contractors for whom we respectively execute this Joint Venture Statement are set forth in the financial statement requirement of the "Qualification Questionnaire" for each contractor.

5. This Joint Venture Statement is executed so that the named contractors, as one organization, may under such Joint Venture, bid upon said Contract, and be awarded the Contract if they should become the successful bidder therefor. Any bid, bond and agreement relating to said Contract shall be executed by any of the undersigned, and when so executed shall bind this Joint Venture and each and every contractor named herein, severally and jointly. Simultaneous with the execution of the Contract, the contractors entering into this Joint Venture shall designate and appoint a Project Supervisor to act as their true and lawful agent with full power and authority to do and perform any and all acts of things necessary to carry out the work set forth in said Contract.

6. We bind the contractors for whom we respectively execute this Joint Venture Statement in firm agreement with the Delaware River and Bay Authority that each of the representations herein set forth is true.

Subscribed and sworn to before me,
this _____ day of
_____, 20__

My commission expires _____

_____
Notary Public

(a) _____
Name of Contractor

By _____
Print Name:

Subscribed and sworn to before me,
this _____ day of
_____, 20__

My commission expires _____

_____
Notary Public

(b) _____
Name of Contractor

By _____
Print Name:

Subscribed and sworn to before me,
this _____ day of
_____, 20__

My commission expires _____

_____
Notary Public

(c) _____
Name of Contractor

By _____
Print Name:

(If Bidder is a Joint Venture, this form must be completed and submitted with the Bid.)

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

QUALIFICATION QUESTIONNAIRE

All Bidders and Subcontractors performing twenty percent (20%) or more of the total value of work of the Contract must complete and submit this form with the corresponding Bid. Use additional sheets as necessary.

Form submitted by _____, an
(Name of Bidder or Subcontractor)

☐ Sole Proprietorship (Individual)
☐ Partnership
☐ Limited Liability Company
☐ Corporation of _____ (State).

Principal Office Address and Telephone Number:

_____

1. How many years has your organization been in business as a Contractor under your present business name? _____

2. How many years of experience does your organization have performing work as shown on the project Plans:

   as a Contractor? _____ as a Subcontractor? _____

3. On a separate piece of paper and attach to this Questionnaire list any information which would indicate the size and capacity of your organization, such as number of employees, equipment owned by your organization, etc.

4. List below the name, address, contact person and telephone number **for each Subcontractor that your organization will use on this Project**, and the percentage (%) of the total dollar value of the Contract that each will perform. Indicate any subcontractors that are certified Minority-Owned, Women-Owned, or Disadvantaged Business Enterprises (collectively, "M/W/DBEs").

_____

_____

5. List below the requested information concerning projects your organization has completed in the last five (5) years for the type of work required in the Contract. (If additional space is required, the information may be listed on sheets prepared by the Contractor and attached to this Questionnaire.)

Project Title and Location	Contract Amount	Required Completion Date	Actual Completion Date	Name, Address, Contact Person and Phone of Owner

6. List below the requested information concerning projects of all types your organization will have underway as of the date Bids are to be received on the Contract:

Project Title and Location	Brief Description	Contract Amount	% Complete	% Sublet	Name, Address, Contact Person and Phone of Owner

7. During the previous ten (10) calendar years, has your organization failed to complete any work (including Subcontractor work) awarded to you? _____ If YES, describe the incident(s), date(s) and location of work on a separate piece of paper and attach to this Questionnaire.

8. During the past five (5) calendar years, has your organization defaulted on a contract or been terminated for any reason, including default? _____ If YES, provide information regarding each default and/or termination on a separate piece of paper and attach to this Questionnaire.

9. Has any officer or partner of your organization ever been an officer or partner of some other organization that failed to complete a construction contract? _____ If YES, state name of individual(s), name(s) of the other organization and reason(s) therefor on a separate piece of paper and attach to this Questionnaire.

10. Has any officer or partner of your organization ever failed to complete a construction contract handled in his or her own name? _____ If YES, state name of individual(s), name of owner(s) or client(s) and the reason(s) therefor on a separate piece of paper and attach to this Questionnaire.

11. Has any lien been filed against a construction project handled by your organization based on allegations of nonpayment against your organization? _____ If YES, state the name of the company filing the lien, the amount of the lien, and whether or not the lien was discharged on a separate piece of paper and attach to this Questionnaire.

12. In the last five (5) years, have liquidated damages been assessed on your organization? _____ If YES, provide information regarding every reason for the liquidated damages and the amount on a separate piece of paper and attach to this Questionnaire.

13. During the previous five (5) calendar years, has your organization been engaged in litigation relating to the performance of a contract? _____ If YES, with respect to each litigation, list the name of every adversary, each party, a description of every contract at issue in the litigation, the status and result(s) of each litigation and the jurisdiction(s), court(s) and docket number(s), on a separate piece of paper and attach to this Questionnaire.

14. During the previous five (5) calendar years, has your organization failed to pay a Subcontractor or supplier for work satisfactorily performed within thirty (30) days of receiving payment from the owner or client for that work? _____ If YES, provide information regarding all payment delays on a separate piece of paper and attach to this Questionnaire.

15. During the previous five (5) calendar years, has your organization incurred a work-related fatality to your workforce? _____ If YES, describe the incident(s), date(s) and location of work-related fatality(s) on a separate piece of paper and attach to this Questionnaire.

16. During the previous five (5) calendar years, has any owner, client, government or other

public entity requested or required enforcement of any of its rights under a surety agreement on the basis of default or in lieu of declaring your organization to be in default? _____ If YES, describe each event on a separate piece of paper and attach to this Questionnaire.

17. Has your organization received any regulatory government agency (i.e., OSHA, EPA, DOT) citations during the previous five (5) calendar years or currently undergoing an investigation or defending a citation, regardless of the nature of alleged violation and outcome? _____ If YES, list the agency, the total number of citations and the nature of each alleged violation on a on a separate piece of paper and attach to this Questionnaire.

18. Are your organization's field supervisors certified in any accredited safety courses (i.e., OSHA 10-hour Construction Safety, OSHA 30-hour Construction Safety, First Aid/CPR/AED)? _____ If YES, attach to this Questionnaire a list of all field supervisors by last and first name, title, and a copy of their safety-related certifications received within the past three (3) years.

19. During the previous five (5) calendar years, has your organization been debarred, suspended, proposed for debarment, declared ineligible, voluntarily excluded, or otherwise disqualified from bidding, proposing or contracting by any local, city, state or federal agency or government? _____ If YES, please provide details of each incident on a separate piece of paper and attach to this Questionnaire.

20. During the previous five (5) calendar years, has your organization experienced or been affected in any way that contributed or caused delay to the overall completion of projects that are the same or substantially similar to the Work contemplated in this Project? _____ If YES, provide information regarding each delay and appropriate mitigation measures on a separate piece of paper and attach it to this form.

Remainder of page intentionally left blank

Based upon the Contractor's answers to this Qualification Questionnaire, the Authority may reject the Bid on grounds of failure to provide adequate information, insufficient financial ability to perform the Contract, inadequate experience to undertake the project, documented failure to perform on prior contracts, prior judgments for breach of contract, criminal conviction, fraud, inadequate labor supply available to complete the project in a timely manner, previous debarment, previous revocation of a license, or previous bankruptcy proceedings, or other indication that the Contractor may not be capable of performing the work or completing the project to the satisfaction of the Authority.

The Authority reserves the right to inquire further with respect to the Contractor's responses; and the Contractor consents to such further inquiry and agrees to furnish all relevant documents and information as requested by the Authority. With the exception of willful falsification of or failure to report an answer, a response to this form which is or may be construed as unfavorable to the Contractor will not automatically result in a negative finding on the question of the Contractor's responsibility.

As an authorized representative of the Bidder/Subcontractor, the undersigned certifies that the information provided on this Qualification Questionnaire is true and accurate.

Name of Bidder/Subcontractor: _____

By: _____

Title: _____

Witness or Attest

_____
(Corporate Seal)

Sworn to and subscribed before me this _____ day of _____ 20____.

_____
Notary Public

My commission expires _____, 20_____.

Note to Bidders: Below is the standard form of contract approved for use by the DRBA which shall serve as the model contract that the DRBA and the Contractor will enter into. It is the responsibility of the Bidder to carefully review the below standard form of contract before submitting a Bid.

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

CONTRACT

This Contract ("Contract"), by and between the DELAWARE RIVER AND BAY AUTHORITY, P.O. Box 71, New Castle, Delaware 19720, a body politic duly created by Compact and an agency for the State of Delaware and the State of New Jersey (herein called the "Authority"), party of the first part; and CONTRACTOR, ADDRESS (herein called the "Contractor"), party of the second part.

WITNESSETH, that the Contractor, for and in consideration of the payments hereinafter specified and agreed to be made by the Authority, hereby covenants and agrees as follows:

ARTICLE ONE. The Contractor shall and will provide and furnish all materials, machinery, implements, appliances and tools and perform all the work and labor required to complete all Work under Contract No. CMLF-C19-06 upon the property within the jurisdiction and control of the Authority, in strict conformity with this Contract, including the executed Contract, Advertisement for Bids, Bid, Consent of Surety, Bid Bond, Non-Collusion Affidavit, Qualification Questionnaire, Joint Venture Statement (if applicable), Contract Bond, Standard Specifications, Special Provisions, Plans and any Addenda, Change Orders, Supplemental Agreements and all other documents specifically issued in connection with this Project, all of which are to be treated as one instrument, and are hereby made a part of this Contract as fully and with the same effect as if the same had been set forth at length in the body of this Contract.

ARTICLE TWO. It is understood and agreed by and between the parties hereto that all the work included in this Contract is to be done under the direction of the Executive Director of the Authority and that his decision as to the true and accurate meaning of said Bid, Plans, Standard Specifications and Special Provisions shall be final. It is further understood and agreed by and between the parties hereto that any additional drawings and specifications as may be necessary to detail and illustrate the work to be done are to be furnished by said Executive Director of the Authority, and the parties hereto agree to conform to and abide by the same so far as it may be consistent with the purpose and intent of the original Bid, Plans, Standard Specifications and

Special Provisions referred to in Article One. It is further agreed by and between the parties that the Contractor is responsible to perform work which is reasonably inferable from and consistent with the intent of the Specifications, Special Provisions, Plans and drawings, whether or not such work is explicitly stated.

ARTICLE THREE. The Contractor agrees to make payment of all proper charges for labor and materials required in the aforementioned work, and to indemnify, defend and save harmless the Authority, its commissioners, officers, agents, employees and servants, and each and every one of them, against and from all suits and costs of every name and description, and from all damages to which the Authority, or any of its commissioners, officers, agents or servants may be subjected by reason of injury to the person or property of others, inclusive of Authority property, resulting from the performance of said work, or through the negligence of said Contractor, its Subcontractors, agents, employees or servants, or through any improper or defective machinery, implements or appliances used by the Contractor in the aforesaid work, or through any act or omission on the part of said Contractor or its Subcontractors, agents, employees or servants.

ARTICLE FOUR. If the construction or work to be done under this Contract shall be abandoned, or if this Contract, or any part thereof, shall be sublet without the previous written consent of the Authority, or if the Contract shall be assigned by the Contractor, without the previous written consent of the Authority, or if at any time the Executive Director shall be of the opinion, and shall so certify in writing to the Authority, that the work, or any part thereof, is unnecessarily or unreasonably delayed, or that the Contractor has violated any provision of this Contract, the Authority may notify the Contractor to discontinue all work or any part thereof; and thereupon the Contractor shall discontinue such work or such part thereof as the Authority may designate, and the Authority may thereupon, by a Contract or otherwise, as it may determine, complete the work or part thereof and charge the entire expense of so completing the work or part thereof to the Contractor; and for such completion the Authority for itself or its contractors, may take possession of or use or cause to be used in the completion of the work or any part thereof, any of such machinery, implements, tools, or materials of any description as shall be found upon the line of said work, and thereafter accounting for, or paying to the Contractor a reasonable compensation for the use of said machinery, implements, tools, or materials.

All costs and charges, including additional expenses, that may be incurred under this Article or any damages including, but not limited to liquidated, actual and consequential damages, that should be borne by the Contractor shall be withheld or deducted from any monies then due, or to become due to the Contractor, under this Contract, or any part thereof; and in such accounting the Authority shall not be held to obtain the lowest cost for the work of completing the Contract or any part thereof, but all sums actually paid therefor shall be charged to the Contractor. In case the costs and charges incurred are less than the sum which would have been payable under the Contract, if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference and in case such costs and charges shall exceed the said sum, the Contractor shall pay the amount of excess to the Authority for the completion of the work.

ARTICLE FIVE. The Authority agrees to pay the Contractor for such work, when completed in accordance with this Contract, the total amount of _____ Dollars and _____ Cents ($). Estimated payments will be made according to the lump sum

prices specified in the Contractor's Bid and in the manner and upon the conditions set forth in the Standard Specifications and Special Provisions.

ARTICLE SIX. It is further mutually agreed between the parties hereto that no estimate given or payment made under this Contract shall be evidence of the performance of this Contract either wholly or in part, and that no payment shall be construed to be an acceptance of defective work or improper materials.

ARTICLE SEVEN. This Contract shall be binding upon the successors in interest of both parties.

ARTICLE EIGHT. This Contract shall be governed by, and construed and enforced in accordance with, the laws of the State of Delaware. The Contractor hereby irrevocably consents, for itself and its heirs, legal representatives, partners, successors and assignees, to the exclusive jurisdiction of the Courts of the State of Delaware and of the United States District Court for the District of Delaware for all purposes in connection with any action or proceeding that arises from or relates to this Contract. The Contractor further waives any rights it may have to personal service of summons, complaint or other process in connection therewith, and agrees that service may be made by registered or certified mail addressed to Contractor at the address set forth in the bid documents.

ARTICLE NINE. Except as otherwise herein provided, any notices under or pursuant to this Contract or any of the documents incorporated herein shall be in writing and shall be delivered by personal delivery, by nationally recognized overnight courier or by certified or registered mail, return receipt requested, using the address set forth in the first paragraph above or at such other address as the party affected shall designate, subsequent to the date of the Contract, by written notice given in the manner hereinabove set forth. Notices shall be deemed given when delivered and receipted for (or upon the date of attempted delivery where delivery is refused), if hand-delivered; or when receipted for (or upon the date of attempted delivery where delivery is refused or a properly addressed and mailed notice is returned as undeliverable or unclaimed), if sent by certified or registered mail.

ARTICLE TEN. Should any part of this Contract be held to be invalid, illegal or unenforceable for any reason whatsoever: (a) the validity, legality and enforceability of the remaining provisions of this Contract (including without limitation, each portion of any Article of this Contract containing any such part held to be invalid, illegal or unenforceable, that is not itself invalid, illegal or unenforceable) shall not in any way be affected or impaired thereby and shall remain enforceable to the fullest extent permitted by law; (b) such part shall be deemed reformed to the extent necessary to conform to applicable law and to give the maximum effect to the intent of the parties hereto; and (c) to the fullest extent possible, the Articles of this Contract (including, without limitation, each portion of any Article of this Contract containing any such part held to be invalid, illegal or unenforceable, that is not itself invalid, illegal or unenforceable) shall be construed so as to give effect to the intent manifested thereby.

ARTICLE ELEVEN. It is expressly understood and agreed that the Contractor, in performing its obligations under this Contract, shall be deemed an independent Contractor and not

an agent or employee of the Authority. In furtherance of the foregoing, and not in limitation, the Contractor has no authority to enter into any contracts or other agreements with any person or entity on behalf of the Authority or to otherwise bind the Authority. Furthermore, nothing contained in this Contract shall either be construed to mean that the Authority and the Contractor are joint venturers, partners or the like, or to establish any contractual relationship between the Authority and any Subcontractor of the Contractor.

ARTICLE TWELVE. The effective date of this Contract shall be on the date the Assistant Secretary of the Authority attests that all parties to this Contract have executed the Contract, as shown on the signature page below.

Signatures on following page

IN WITNESS WHEREOF, the undersigned have duly executed this Contract, effective upon the day and year below as attested by the Assistant Secretary of the Authority.

[CONTRACTOR]

By: _____

Name: _____

Title: _____

Date: _____

DELAWARE RIVER AND BAY AUTHORITY

By: _____
Chairman

By: _____
Vice Chairman

By: _____
Executive Director

Attest: _____
Assistant Secretary

Date: _____

Note to Bidders: Unless stated otherwise in the Special Provisions, after the Contractor has received the written notice of Contract Award, and before the Authority will begin its execution process of said Contract, the Contractor must furnish a Contract Bond to the Authority in a sum equal to the cost of the Base Bid plus any Alternate Pay Items (as applicable) that the Authority has elected to include in the Contract. Below is the form approved for use by the DRBA. For additional information see Section 103.05 Contract Performance and Payment Bonds.

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

CONTRACT BOND

We, the undersigned, _____

as principal (herein called the "Principal"), and _____

_____

a _____ of the State of _____, which is legally authorized to do business in the State of New Jersey, where the work is to be performed, as surety (herein called the "Surety"), do hereby agree to be held and bound unto the Delaware River and Bay Authority (herein called the "Authority") for the sum of _____

Dollars and _____Cents ($_____), which sum is to be paid to the Authority for its use and benefit. Further, for such payment well and truly to be made, we do hereby bind ourselves and our heirs, executors, administrators, successors, and assigns, jointly and severally.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH that if the Principal, to whom the Authority has awarded Contract No. CMLF-C19-06 (herein called the "Contract") for the performance of certain work for the Authority, which Contract is incorporated herein by reference, shall well and truly provide and furnish all the materials, appliances and tools and perform all the work required under and pursuant to the terms and conditions of the Contract and of the Bid, Plans, Standard Specifications, Special Provisions and Technical Specifications contained therein, or any changes or modifications thereto made as therein provided, and shall also indemnify, defend and save harmless the Authority from all costs, damages and expenses growing out of or by reason of the performance of the Contract and shall well and truly pay all and every

person furnishing material or performing labor in and about the performance of the work under the Contract, all and every sum or sums of money due him, them or any of them, for all such labor and materials for which the Principal is liable; then this obligation shall be void; otherwise it shall be and remain in full force and effect.

If for any cause the Principal fails or neglects to so fully perform and complete such work, the Surety, for value received, hereby stipulates and agrees, if requested by the Authority:

(i) to fully perform and complete the work to be performed under the Contract pursuant to the terms, conditions and covenants thereof; or

(ii) to pay to the Authority upon demand amounts necessary to pay all costs incurred by the Authority (including appropriately allocated internal costs of the Authority) to enable the Authority to fully perform and complete the work to be performed under the Contract (but not exceeding the amount set forth in the first paragraph hereof);

If the Authority requests option (i) above, the Surety further agrees to commence such work of completion within twenty (20) calendar days after written notice thereof from the Authority and to complete such work within such reasonable time as the Authority may determine.

The Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of the Surety and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, change, delay or disruption in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and the Surety does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to the Surety as though done or omitted to be done by or in relation to the Principal.

The Surety hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the Contract, or in or to the Plans, Standard Specifications, Special Provisions and Technical Specifications therefor, shall in any way affect its obligation under this Contract Bond.

Remainder of page intentionally left blank

IN WITNESS WHEREOF, the Principal and Surety have duly executed this Contract Bond as of _____ ___, 20___.

[PRINCIPAL]

Name: _____

Witness or Attest: Address:_____

_____

By: _____

_____ Title: _____

(Corporate Seal)

[SURETY]

Name: _____

Address: _____

_____

Witness or Attest:

By: _____

_____

Title: _____

_____

(Corporate Seal)

Note to Bidders: Unless stated otherwise in the Special Provisions, at the Conclusion of Work the Authority will not make final payment until the Contractor has furnished the below Maintenance Bond to the Authority in a sum equal to five percent (5%) of the final Contract amount. Below is the form approved for use by the DRBA. For additional information see Section 105.20 Project Acceptance; Guaranty Against Defective Work.

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

MAINTENANCE BOND

We, the undersigned, _____

_____

as principal (herein called the "Principal"), and _____

_____

a _____ of the State of _____, which is legally authorized to do business in the State of New Jersey, where the work has been performed, as surety (herein called the "Surety"), do hereby agree to be held and bound unto the Delaware River and Bay Authority (herein called the "Authority") for the sum of _____

_____Dollars and _____Cents

($_____), which sum is to be paid to the Authority for its use and benefit.

Further, for such payment well and truly to be made, we do hereby bind ourselves and our heirs, executors, administrators, successors, and assigns, jointly and severally.

WHEREAS the Principal entered into a contract with the Authority known as Contract No. CMLF-C19-06 (herein called the "Contract"), which Contract is incorporated herein by reference; and

WHEREAS the Principal has represented that it has completed the Contract in strict and entire conformity with the Plans and Specifications therefor on file at the office of the Authority;

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if, within two (2) years from the date of final written acceptance of the work by the Authority, no faulty workmanship shall be disclosed in the performance of the Contract, including any Change Orders or Supplemental Agreements thereto, and if it shall appear that no defective materials were furnished thereunder, and if it shall appear that all work was performed and all materials were furnished thereunder in strict and entire conformity with the terms of the Contract, including any Change Orders or Supplemental Agreements thereto, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

If, within said period of two (2) years, faulty workmanship is disclosed or it appears that defective materials were furnished, or it appears that the work was not performed or the materials were not furnished in strict and entire conformity with the terms of the Contract documents, then the Authority shall so notify the Principal in writing and the Principal shall promptly repair, replace and make good all defective work or materials. In the event that the Principal, after having been so notified, shall refuse or neglect to repair, replace or make good such work or materials within five (5) days from the receipt of such notice (or within such other time as the Executive Director of the Authority may direct), or shall fail to complete such work within the time prescribed by said Executive Director, then the Authority will proceed to have the work done by others, and the Principal and Surety hereunder shall jointly and severally be liable to pay the cost thereof, subject to the monetary limitation first written above. In case of an emergency, as determined by said Executive Director, the Authority reserves the right to immediately effect both temporary and permanent repairs, or to arrange for others to effect such repairs, without immediate notification to the Principal, and the Principal and Surety hereunder shall jointly and severally be liable to pay the cost thereof.

Further, if in the event no faulty workmanship defective materials or nonconforming work, is disclosed or discovered within the two-year period, this shall in no way bar, or be used as a defense to the Authority's ability to bring a cause of action for breach, negligence, or other theory, within the term allowed by law, against Contractor and other responsible parties.

Remainder of page intentionally left blank

IN WITNESS WHEREOF, the Principal and Surety have duly executed this Maintenance Bond as of _____ ___, 20___.

[PRINCIPAL]

Name: _____

Witness or Attest: Address:_____

_____

By: _____

_____ Title: _____

(Corporate Seal)

[SURETY]

Name: _____

Address: _____

_____

Witness or Attest:

By: _____

_____

Title: _____

_____

(Corporate Seal)

Note to Bidders: Unless stated otherwise in the Special Provisions, at the Conclusion of Work the Authority will not make final payment until the Contractor has furnished the Contractor's Release of Liens. Below is the form approved for use by the DRBA. For additional information see Section 109.10 Final Payment.

DELAWARE RIVER AND BAY AUTHORITY

CAPE-MAY LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

CONTRACTOR'S RELEASE OF LIENS

Date: _____

Delaware River and Bay Authority
Post Office Box 71
New Castle, Delaware 19720

Re: Contract No. CMLF-C19-06
CAPE MAY TERMINAL POLICE DISPATCH CENTER REHABILITATION

Gentlemen:

This is to certify that all just liens, claims and demands for labor, materials and rental of equipment arising out of the prosecution of the work under the above-named contract are fully paid and satisfied and that all of the work is fully released, freed and discharged from all liens, claims and demands, whatsoever, whether just or otherwise of any contractors, subcontractors, materialmen, suppliers, laborers, artisans or architects.

In consideration of the final payment of said contract, we hereby remise, release and forever discharge the Delaware River and Bay Authority, its commissioners, officers, representatives, employees, agents, and servants from any and all manner of actions and cause of actions, suits, debts, accounts, bonds, covenants, contracts, agreements, judgments, liens, demands and liability of whatever nature in law and in equity from anything done or furnished or in any manner growing out of the doing of the work under the above-named contract including any and all extra or reduction orders issued thereunder and any agreements supplementary thereto, and anything whether known or unknown, suspected or unsuspected or which we ever had, now have or which our heirs, executors, administrators, successors or assigns shall or may have; and we hereby agree

to indemnify, defend and hold harmless the Delaware River and Bay Authority against any and all claims which hereafter may be made or instituted against it by any contractors, subcontractors, materialmen, suppliers, laborers, artisans or architects for the purpose of enforcing a lien, claim or demand arising out of the prosecution of the work under the above-named contract.

Compliance with the foregoing, as related to statutory liens, is a matter of administrative convenience. It is the Authority's position that the property of the Authority, as an agency of the States of Delaware and New Jersey, is not subject to the filing of statutory liens as a matter of law.

Contractor: _____

Address: _____

_____

Witness or Attest:

By: _____

Title: _____

_____
(Corporate Seal)

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

STANDARD SPECIFICATIONS

Together, parts (i) and (ii) below, as modified by any Special Provisions or by documents of any description furnished by the DRBA as part of the Contract, form the "Standard Specifications" and shall govern the execution of the Contract:

(i) Division 100 – General Provisions of the *Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction*, dated December 15, 2014; and

(ii) Divisions 200 through 1000 of the *Delaware Department of Transportation ("DelDOT") Standard Specifications for Road and Bridge Construction*, dated June 2021, including any Standard Items and Special Provisions, as published on the DelDOT website ("DelDOT Standard Specifications").

The Standard Specifications, as defined above, are hereby made a part of the Contract as fully and with the same effect as if set forth at length herein.

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * *

SPECIAL PROVISIONS - PART I

AMENDMENTS TO GENERAL PROVISIONS OF THE STANDARD SPECIFICATIONS

The following clauses represent modifications to Division 100 - General Provisions of the *Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction*, dated December 15, 2014 (the "General Provisions").

Any modifications given herein will specifically identify the Section or Subsection of the General Provisions within which the modification is to occur and whether that particular modification is an insertion, deletion or replacement of the original provision.

Any provision set forth in the Standard Specifications that is not modified by or in conflict with the Special Provisions of this Part I shall be understood to remain in full force and effect.

101.75.2 Standard Specifications.

Delete the provisions of Subsection 101.75.2 and replace with the following:

Division 100 – General Provisions of the Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction, dated December 15, 2014; and Divisions 200 through 1000 of the DelDOT Standard Specifications for Road and Bridge Construction, dated June 2021, including any Standard Items and Special Provisions, as published on the DelDOT website.

101.83.2 Supplemental Specifications (DelDOT Supplemental Specifications).

Delete the provisions of Subsection 101.83.2 and replace with the following:

Approved DelDOT additions or revisions to Sections 200 through 1000 of the DelDOT Standard Specifications for Road and Bridge Construction, dated June 2021, as published on the DelDOT website.

102.05 Examination of Plans, Specifications, Contract Documents, and Site of Work.

Insert the following after the last paragraph:

A non-mandatory pre-bid meeting and site visit will be held on March 31, 2022, at 11:00 a.m. local time at the Cape May Ferry Administration Building, 1200 Lincoln Blvd., North Cape May, New Jersey 08204. All visitors must check-in with the DRBA Police Department at Building C-2 to obtain a Visitor I.D. badge and must wait at the Administration Building entrance area for further instructions from DRBA staff. All visitors must follow the personal protective equipment requirements in accordance with DRBA policy. Unsupervised access to the project site is prohibited.

102.07 Irregular Bids.

Delete part (e) and replace with the following:

(e) If any documents necessary for bidding purposes are not completed, are improperly executed, or are missing (including the Bid Bond) or if the Bid is submitted by Bidders whose names are not recorded by the Authority as having secured the Contract Documents by subscribing to the project via CapEx.

102.08 Bid Guaranty.

Delete all and replace with the following:

The Bid shall be accompanied by a Bid Bond, on the form furnished by the Authority and included in the Contract Documents, for a sum of not less than ten percent (10%) of the Total Price.

103.04 Return of Bid Guaranty.

Delete all and replace with the following:

In the event the award of the Contract is annulled because the Bidder to whom the award is made fails to execute and have delivered on time the Contract and other prescribed documents, that Bidder's Bid Bond shall become operative, as provided in Subsection 103.07.

103.07 Failure to Execute Contract.

Delete the second paragraph and replace with the following:

It is understood and agreed by said Bidder that if the Award is annulled for the reasons as specified in Subsection 103.04, the Authority may proceed to recover under the terms and provisions of the Bid Bond, at the discretion of the Chairman.

103.09 Withdrawal of Bid.

Delete the following sentence:

The Authority reserves the right to retain the Bid Guaranty in full or in part as Liquidated Damages.

103.10 Insurance.

Insert the following prior to all paragraphs of this Subsection:

****BIDDERS: DO NOT BID ON THIS PROJECT UNTIL YOU HAVE REVIEWED THE FOLLOWING PROVISIONS WITH YOUR INSURANCE PROVIDER. AFTER THE BID DUE DATE HAS PASSED, THESE PROVISIONS BECOME NON-NEGOTIABLE. THE AWARDED BIDDER WILL BE REQUIRED TO PROVIDE EVIDENCE OF MEETING THE FOLLOWING INSURANCE PROVISIONS PRIOR TO FINAL EXECUTION OF THE CONTRACT.***

Remove the fourth sentence of the second paragraph and replace with the following:

Notwithstanding the foregoing, the Authority reserves the right to request evidence of insurance, including a copy of the policy(ies) and/or endorsement(s), at such additional intervals as it determines in its sole discretion.

Remove the fifth sentence of the second paragraph and replace with the following:

In the event of cancellation, non-renewal, expiration, termination or alteration (whether by the insurer or the Contractor) of such policy(ies) or in the event the coverage thereof is altered below the limits required by the Contract, Contractor shall provide the Authority with thirty (30) Days prior written notice of such cancellation, non-renewal, expiration, termination or alteration.

Insert the following after the final paragraph of Subsection:

The Contractor is responsible for subcontractor performance and shall require all Subcontractors to possess adequate insurance coverage. The minimum requirements of insurance to be carried by the Contractor and any Subcontractor shall be as follows:

A. Workers' Compensation and Employer's Liability Insurance. **The prevailing NCCI policy form which shall be used is WC 00 00 00C 01-05.**

   i. State Act / Employer's Liability: $1,000,000/$1,000,000/$1,000,000 as required by the statutory limits according to the laws of the State of New Jersey.

   The insurer shall waive, and the Contractor shall be responsible for confirming that the insurer has waived, any right of subrogation against the Authority to the maximum extent permitted by law. Any deductible shall be the responsibility of the Contractor and shall not be claimed against the Authority.

B. Commercial General Liability. **The prevailing ISO policy form which shall be used is CG 00 01 04-13**.

   Commercial General Liability policy with limits of not less than One Million Dollars ($1,000,000) each occurrence, Two Million Dollars ($2,000,000) products liability/completed operations aggregate and Two Million Dollars ($2,000,000) general aggregate (applicable per project). Products/completed operations coverage to remain in effect for a period not less than the New Jersey statute of repose after the work has been completed. Any aggregate to be by project and the policy shall not contain any XCU exclusions.

C. Business Automobile Liability Insurance. **The prevailing ISO policy form which shall be used is CA 00 01 11-20.**

   Business Automobile Liability to provide the following coverage for all owned, non-owned, hired or borrowed vehicles and registered equipment:

   i. Bodily Injury and Property Damage Liability with a Combined Single Limit of not less than One Million Dollars ($1,000,000) for all damages because of bodily injury and property damage suffered by one or more persons as the result of any one accident.

D. **Contractor's Pollution Liability and Clean-up Costs.**

   A Contractor's Pollution Liability and Clean-up Costs policy with limits of not less than One Million Dollars ($1,000,000) each claim and Two Million Dollars ($2,000,000) aggregate. The policy retro date shall be concurrent with, or prior to, the contract and coverage is to remain in effect for no less than three (3) years after the Work has been completed.

i. At minimum, coverage shall include Clean-up costs, 3rd party bodily injury/property damage, 3rd party property loss of use, Emergency response costs, Non-Owned Disposal Sites and Pollution Transportation.
ii. Include the Authority as additional insured.
iii. Provide primary and non-contributory language for the Authority.
iv. Provide a 30-day notice of cancellation and waiver of subrogation to the Authority.

E. Umbrella or Excess Liability.

An Umbrella or Excess Liability policy with a limit of not less than Five Million Dollars ($5,000,000) (applicable per project) in excess of and including the coverage stipulated in the primary policies as stated above under Sections A, B and C. The umbrella policy should include additional insured/primary and non-contributory provisions for DRBA's benefit.

F. Additional Insured.

With respect to the minimum insurance requirements outlined above, the Contractor and all Subcontractors are to name the Authority as additional insured under Section B on a primary and non-contributory basis using forms #CG 2010, #CG 2037 and #CG 2038. *(Note: Form #CG 2038 may be waived by the DRBA if no Subcontractors will be providing Work).* Furthermore, the Authority is to be added as an additional insured under Sections C, D and E on a primary and non-contributory basis. The Umbrella policy outlined in Section E should be written to follow form of the coverages afforded in Sections A, B and C. In addition, the insurer for the Contractor and all Subcontractors shall waive, and the Contractor and its Subcontractors shall be responsible for confirming that the insurer of all policies has waived, any right of subrogation against the Authority to the maximum extent permitted by law. The Contractor and all Subcontractors agree to indemnify the Authority from any costs or liabilities arising in the Court if the Contractor's insurer fails to waive subrogation as required. Any deductible or self-insured retention shall be the responsibility of the Contractor and shall not be claimed against the Authority.

If any policy above has a deductible or self-insured retention, the Contractor and any Subcontractor shall not claim against the DRBA for any reimbursement of said deductible or self-insured retention, regardless of the cause of loss. The Insurance Certificate(s) shall indicate all deductibles and/or self-insured retentions.

Duration of Insurance. The insurance policies as required by sections A, B, C, D and E shall be kept in full force and effect during the performance of this Contract and until the Contractor has fully performed all work hereunder. In addition, under section B after the work is completed/accepted by the Authority, the products/completed operations coverage is to remain in effect for a period not less than the New Jersey statute of repose. Regarding the insurance required by section D above, the coverage is to remain in effect for not less than three (3) years after work has been completed.

105.08 Cooperation Between Contractors.

Add the following after the last paragraph:

The Contractor is advised that work by Authority maintenance and operations personnel will be working simultaneously with the Work required under the Contract. The Contractor is expected to accommodate Authority maintenance and operations personnel while performing its duties under the Contract. In addition, there may be other contractors working at the project site and all traffic closures and work associated with the Contract shall be coordinated with other ongoing projects. The Contractor is required to provide notice to the Authority in writing, within a reasonable time if problems coordinating with other contractors or Authority personnel should arise. The reasonability of Contractor's notice shall be determined at the sole discretion of the Authority.

105.20 Project Acceptance.

Under the part titled "Guaranty Against Defective Work", replace the first, second and third paragraphs with the following:

Before final payment is made as provided in Subsection 109.10, the Contractor shall furnish a Maintenance Bond to the Authority in a sum equal to five percent (5%) of the final Contract price. The Maintenance Bond shall be on the form furnished by the Authority and with Surety satisfactory to the Authority. The Maintenance Bond shall remain in full force and effect for a period of two (2) years from the date of final acceptance of the Project by the Authority. The Contractor shall also furnish a Contractor's Release of Liens before final payment is made.

Before semifinal payment is made following the suspension of Work as provided in Subsection 104.07 and Subsection 109.07, the Contractor shall furnish a Maintenance Bond in a sum equal to five percent (5%) of the estimated value of the Work completed prior to the time the Project was suspended, and the Maintenance Bond shall remain in effect for a period of two (2) years from the date of suspension.

The Maintenance Bond (in either case) shall provide that the Contractor guarantees to replace for said period of two (2) years all Work performed and Materials furnished that were not performed or furnished according to the terms of the Contract, and make good defects thereof, regardless of cause, which have become apparent before the expiration of said period of two (2) years.

Under the part titled "Guaranty Against Defective Work", replace the ninth paragraph with the following:

If within twenty-four (24) months after final acceptance of the Work there shall appear or be discovered any weakness, any deficiency, any failure, or any breaking down or deterioration caused by a deficiency in design, workmanship, or material furnished by the Contractor, and all other, materials, machinery, or equipment, damage to which was caused by such defective work, materials, machinery or equipment (herein called a "guarantee deficiency"), such guarantee deficiency shall be made good, at the Contractor's expense, to meet the requirements of the Specifications and this Contract.

106.07 Storage and Handling of Materials

Insert the following after the last paragraph of Subsection 106.07:

Recycling and Processing Facility Records: The Contractor shall provide the Authority with documentation that indicates the receipt and acceptance of recyclable waste by recycling and processing facilities permitted to accept recyclable waste. The Contractor shall provide manifests, weight tickets, receipts, and invoices. All regulated materials sent on a manifest must be signed by a representative of the Authority's Environmental, Health and Safety ("EHS") Department.

107.02 Permits, Licenses and Taxes

Insert the following after the last paragraph of Subsection 107.02:

The Contractor shall submit and obtain a written permit prior to performing "Hot Work" (i.e., welding or cutting) or operating other flame-producing/spark-producing devices, from a representative of the Authority's Environmental, Health and Safety ("EHS") Department. The Contractor shall provide at least two 9 kg 20-pound 4A:20 BC-rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged and contain an approved safety pin and tamper-resistant seal. It is also mandatory to have a designated fire watch for any "Hot Work" done at this activity. The fire watch must be trained in accordance with NFPA 51B and must remain on-site for a minimum of one (1) hour after completion of the task or as specified on the "Hot Work" permit. The fire watch shall not perform any other duties in combination with fire watch activities.

Before starting work in any Authority facility, the Contractor personnel shall familiarize themselves with the location of the nearest fire alarm boxes and have ready access to the local fire department emergency phone number. THE CONTRACTOR MUST REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE AUTHORITY REPRESENTATIVE IMMEDIATELY.

107.06 Construction Safety, Health, and Sanitary Standards

Insert the following after the first paragraph of Subsection 107.06:

Prior to beginning Work, the Contractor shall prepare a Health & Safety Plan for the review and approval of the Authority's Environmental, Health and Safety ("EHS") Department. The Health & Safety Plan should address the following areas, including but not limited to: hot work, crane lifts, working at heights, emergency response, hazardous materials management and disposal, respiratory protection and storm water management. The Health & Safety Plan shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The Health & Safety Plan shall interface with the Contractor's overall safety and health program. Any portion of the Contractor's overall safety and health program that is referenced in the Health & Safety Plan shall be included as appropriate. The Health & Safety Plan must include the following:

1. SIGNATURE SHEET. Title, signature, and phone number of the following:

    a. Plan preparer (qualified person such as Contractor's safety personnel).
    b. Plan must be approved, by company/corporate officers authorized to obligate the company (e.g., owner, company president, regional vice president, etc.).
    c. Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC).

2. BACKGROUND INFORMATION. List the following:

    a. Contractor
    b. Contract number
    c. Project name
    d. Brief project description, description of work to be performed, and location (map)
    e. Contractor accident experience (provide information such as experience modification rate ("EMR"), Occupational Safety and Health Administration ("OSHA") 300 Forms, corporate safety trend analyses, etc.).

3. STATEMENT OF SAFETY AND HEALTH POLICY. Provide a copy of current corporate/company Safety and Health Policy Statement.

4. RESPONSIBILITIES AND LINES OF AUTHORITIES.

    a. Identification and accountability of personnel responsible for safety - at both corporate and project level. (Contracts specifically requiring safety or industrial hygiene personnel should include a copy of their resume as part of the Qualifications Questionnaire)
    b. Lines of authority.

5. SUBCONTRACTORS AND SUPPLIERS. Provide the following:

    a. Identification of Subcontractors and suppliers (if known);
    b. Means for controlling and coordinating Subcontractors and suppliers; and
    c. Safety responsibilities of Subcontractors and suppliers.
    d. Waste haulers must supply their EPA ID number and relevant RCRA/DOT training to the EHS Department.
        i. Only authorized members of the EHS Department may sign regulated waste manifests.

6. TRAINING.

    a. List subjects to be discussed with employees in safety indoctrination.
    b. List mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, confined space entry, crane operator, diver, vehicle operator, HAZWOPER training and certification, PPE) and any requirements for periodic retraining/recertification.
    c. Outline requirements (who attends, when given, who will conduct, etc.) for supervisory

and employee safety meetings.

7. SAFETY AND HEALTH INSPECTIONS. Provide details on:

    a. Who will conduct safety inspections (e.g., PM, safety professional, QC, supervisors, employees), proof of inspector's training/qualifications, when inspections will be conducted, how the inspections will be recorded, deficiency tracking system, follow-up procedures, etc. The names of competent and/or qualified person(s) and proof of competency/ qualification to meet specific OSHA-competent/qualified person(s) requirements must be attached.
    b. Any external inspections/certifications that may be required.
    c. "Hot work" permits must be signed-off by the EHS Department (template will be provided during pre-construction meeting).
    d. All crane lifts must be reviewed by the EHS Department (template will be provided during pre-construction meeting).

8. SAFETY AND HEALTH EXPECTATIONS AND COMPLIANCE.

    a. The company's written safety program goals, objectives, and accident experience goals for this contract shall be provided.
    b. Policies and procedures regarding noncompliance with safety or environmental requirements (to include disciplinary actions for violation of requirements) shall be identified.
    c. Provide written company procedures for holding managers and supervisors accountable for safety.
    d. Chemicals must be stored appropriately and securely in containers that are in good condition (e.g., no rust, dents, etc.).
    e. 55-gallon drums of flammable liquids are not permitted to be stored at Authority properties.
    f. All containers and equipment must be covered to prevent runoff into the Stormwater system.
    g. Spill response equipment must be readily available in the event of a release.

9. INCIDENT REPORTING. The Contractor shall identify who, how, and when the following will be completed:

    a. Exposure data (man-hours worked);
    b. Incident investigations, reports, and logs;
    c. Immediate notification of major accidents;
    d. Environmental incidents must be reported to the NRC/DNREC/NJDEP within 15 minutes of the release;
        i. DRBA Project Engineer and EHS Department must be notified immediately after notification to responding agency.

10. MEDICAL SUPPORT. Outline on-site medical support and off-site medical arrangements including rescue and medical duties for those employees who are to perform them, and the

name(s) of on-site Contractor personnel trained in first aid and CPR. Must also identify which medical facilities will be contacted in the event of an incident.

11. PERSONAL PROTECTIVE EQUIPMENT ("PPE"). Outline procedures (who, when and how) for conducting hazard assessments and written certifications for use of PPE. Outline procedures to be followed to assure the proper use, selection, and maintenance of personal protective and lifesaving equipment (e.g., protective footwear, protective gloves, hard hats, safety glasses, hearing protection, body harnesses, lanyards). PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes the following:

    a. Hard Hat.
    b. Long Pants.
    c. Appropriate Safety Shoes.
    d. Class III Reflective Vests.
    e. Fall protection must be worn within 6 feet of the edge of a building if no railing is present.
    f. Fall protection must be worn in all man lifts (scissor lifts, bucket trucks, etc.).

12. FALL PROTECTION PROGRAM:

    a. Establish a site-specific fall protection and prevention program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation.

    b. Training: Institute a fall protection training program. As part of the fall protection and prevention plan, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection. Document training and practical application of the competent person in accordance with OSHA § 1926.503 (a).

    c. Fall Protection Equipment and Systems: Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the site-specific fall protection and prevention plan at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards.

13. CONTRACTOR INFORMATION. The Contractor shall provide information on how they will meet the requirements of applicable items within the plan. As a minimum, excavations, scaffolding, medical and first-aid requirements, sanitation, PPE, fire prevention, electrical safety, public safety requirements shall be addressed as applicable.

107.07 Public Convenience and Safety.

Insert the following after the first sentence of Subsection 107.07:

The Contractor shall provide emergency contact information to the DRBA at the pre-construction meeting. The information shall include the following and be posted at the project site:

EMERGENCY CONTACT INFORMATION

CONTRACT _____

Contact the following in the event of an emergency or hazardous condition on this construction project

Contractor Superintendent

Name_____
Cell Phone Number _____
Emergency Contact Number _____

Contractor Information

Firm Name _____
Home Office Address _____
City, State _____
Home Office Phone _____

107.14 Hazardous Material.

Insert the following after the fourth paragraph of Subsection 107.14:

Hazardous Material Use: Each hazardous material must be approved in writing by the Authority's Environmental, Health and Safety ("EHS") Department prior to being brought onto the project site or prior to any other use in connection with this Contract. Allow a minimum of ten (10) working days for processing of the request for use of a hazardous material.

Hazardous Material Exclusions: Notwithstanding any other hazardous material used in this Contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls ("PCBs"), di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Authority, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low-mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further approval. Notify the EHS Department prior to excepted items of radioactive material and devices being brought on Authority property.

Unforeseen Hazardous Material: Materials such as PCBs, lead paint, and friable and non-friable asbestos and other Occupational Safety and Health Administration (OSHA)-regulated chemicals (i.e., 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Authority immediately. Within fourteen (14) calendar days the Authority will determine if the material is hazardous. During this fourteen (14) calendar day period, Contractor shall continue all other portions of the Work and, without additional compensation, coordinate and adjust the order of the Work to minimize impact to the overall Project completion date set forth in Section 108.08. If material is not hazardous or poses no danger, the Authority will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish

the work, the Authority will issue a modification pursuant to Differing Site Conditions as specified in subsection 104.06.

108.01 Subletting of the Contract.

Delete the third and fourth paragraphs and replace with the following paragraphs:

Except by special written consent of the Authority to do otherwise, the Contractor shall perform Work of a value of no less than thirty percent (30%) of the awarded Contract with the Contractor's own organization and with the assistance of workmen under the Contractor's immediate supervision.

Contract Award shall not be construed to be an approval of any subcontract, supply contract or any associated terms. Each Subcontractor agrees, as a condition of entering into a subcontract on the Project, to make no claim whatsoever against the Authority or its commissioners, officers, servants, agents or employees for any Work performed or thing done by reason of said subcontract or for any other cause whatsoever that may arise by reason of the relationship created between the Contractor and subcontractor by the subcontract. Prior to the issuance of the Notice to Proceed, the Contractor shall provide to the Authority a complete list of all subcontractors anticipated to work on Authority property and, for the Contractor and all subcontractors, a valid copy of the current state business license appropriate to the state in which the work will occur. This list shall also include certified statements that each subcontractor is acquainted with all the provisions of the Contract and agrees thereto. The Contractor shall be responsible for keeping to-date the subcontractor list and all associated state business licenses throughout the duration of the Project.

108.02 Notice to Proceed.

Delete all and replace with the following:

Following the Contract execution, the Engineer may schedule a preconstruction meeting. Before a "Notice to Proceed" date is issued, the Contractor shall submit to the Engineer:

(a) A list of anticipated subcontractors;
(b) For both the Contractor and all subcontractors, proof of a valid state business license appropriate to the state(s) in which the work will occur per Subsection 108.01; and
(c) Progress schedule per Subsection 108.04.

The Engineer will issue to the Contractor a Notice to Proceed which will stipulate the date on or before which the Contractor is expected to begin Work. The date specified in the Notice to Proceed will be at least ten (10) Calendar Days subsequent to the date of issuance of the Notice to Proceed. No Work is to be started before receipt of the Notice to Proceed. The specified Contract Time shall begin on the Day the Work actually starts or on the date stipulated in the Notice to Proceed, whichever is earlier.

108.04 Progress Schedules.

Add the following before the first sentence:

Within ten (10) calendar days of the execution of the Contract, the Contractor shall furnish to the Authority a progress schedule including all relevant activities, satisfactory to the Authority, shop drawing submittals and long-lead delivery materials and dates. It is the intent of the Authority to issue the Notice to Proceed upon acceptance of the schedule.

The work schedule shall accommodate the time necessary to acquire materials, including long lead items, and to complete all work as described in the Contract Documents, taking into account any and all regulatory permit requirements and restrictions and other special requirements. Calendar days shall be charged against the schedule upon the first day of actual work per the approved progress schedule regardless of the Contractor's continued presence on the site. **The Contractor's construction schedule shall show construction beginning on or about September 1, 2022.** Actual start dates are to be agreed upon between the Contractor and the Authority.

108.08 Failure to Complete on Time.

Delete the first sentence of the first paragraph and replace with the following:

All work on the project must be completed within One Hundred and Ninety-Five (195) calendar days after the start date listed on the "Notice to Proceed" correspondence issued by the Authority. It is the intent of the Authority to authorize the Contractor to proceed with the work on or about September 1, 2022. **TIME IS OF THE ESSENCE.**

108.09 Schedule of Liquidated Damages.

Delete the first sentence of the first paragraph and replace with the following:

For each day that the Contractor is in default following the passing of the completion date as stipulated in Subsection 108.08, the Contractor shall pay the Authority Liquidated Damages in accordance with the following Table:

Awarded Contract Value:		**Amount to be Charged to Contractor Per Day**
For More Than	**To and Including**	
$50,000	$100,000	$430
$100,000	$500,000	$670
$500,000	$1,000,000	$870

[End of Special Provisions - Part I]

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * * * * *

SPECIAL PROVISIONS

PART II – ADDITIONAL GENERAL PROVISIONS

The following clauses represent general provisions which shall be added to Division 100 – General Provisions of the Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction, dated December 15, 2014. In a case of conflicting requirements, this Part II shall govern over:

(i) Division 100 – General Provisions of the *Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction*, dated December 15, 2014; and
(ii) Part I of the Special Provisions provided herein.

Any applicable provision set forth in the Standard Specifications that is not modified by or in conflict with the Special Provisions of Parts I-II shall be understood to remain in full force and effect. In any case where there exists an inconsistency among the additional General Provisions and the Standard Specifications, the additional General Provisions of this Part II shall govern.

[NO ADDITIONAL GENERAL PROVISIONS]

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * * * * *

SPECIAL PROVISIONS - PART III

AMENDMENTS TO STANDARD TECHNICAL SPECIFICATIONS

The following clauses represent amendments to the technical specifications of Divisions 200 through 1000 of the *Delaware Department of Transportation ("DelDOT") Standard Specifications for Road and Bridge Construction*, dated June 2021, including any Standard Items and Special Provisions, as published on the DelDOT website ("DelDOT Standard Specifications"), which are to be modified for purposes of the above Contract.

In case of conflicting requirements, this Part III shall govern over:

(i) The DelDOT Standard Specifications, as defined above; and
(ii) Division 100 – General Provisions of the *Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction*, dated December 15, 2014; and
(iii) Part I of the Special Provisions provided herein; and
(iv) Part II of the Special Provisions provided herein.

Any modification given in this Part will specifically identify the Division, Section and Subsection within which the amendment is to occur and whether that particular modification is an insertion, a deletion, or a replacement for the designated DelDOT Standard Specification.

Any applicable provision set forth in the Standard Specifications that is not modified by or in conflict with the Special Provisions of Parts I-III shall be understood to remain in full force and effect.

THE FOLLOWING ARE BROAD MODIFICATIONS TO BE MADE WITHIN DIVISIONS 200-1000 OF THE DELDOT STANDARD SPECIFICATIONS, DATED AUGUST 2016:

Chief Traffic Engineer. The term "Chief Traffic Engineer" shall mean "Engineer" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

Delaware MUTCD or DE MUTCD. Any reference to "Delaware MUTCD" or "DE MUTCD" throughout the DelDOT Standard Specifications shall mean "MUTCD" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

DelDOT Contact. Any reference to a "DelDOT Contact" throughout the DelDOT Standard Specifications shall mean an "Authority Contact".

DelDOT Owned. Any reference to "DelDOT Owned" throughout the DelDOT Standard Specifications shall mean "Authority-owned".

DelDOT Personnel. Any reference to "DelDOT Personnel" throughout the DelDOT Standard Specifications shall mean "Authority Personnel".

DelDOT Project. Any reference to "DelDOT Project" throughout the DelDOT Standard Specifications shall mean "Authority Project".

DelDOT Project Resident. Any reference to "DelDOT Project Resident" throughout the DelDOT Standard Specifications shall mean "Engineer".

DelDOT's Safety Section. Any reference to "DelDOT's Safety Section" shall mean the "Authority" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

DelDOT Transportation Management Center (TMC). The term "DelDOT Transportation Management Center" or "TMC" shall mean "Authority" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

Department. The term "Department" shall mean "Authority" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

Department's District Maintenance Yard. Any reference to the "Department's District Maintenance Yard" shall mean "Authority" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

District Engineer. Any reference to "District Engineer" throughout the DelDOT Standard Specifications shall mean the "Engineer" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

District Maintenance Yard. Any reference to the "District Maintenance Yard" shall mean "Authority" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

Materials and Research Section. Reference to the "Materials and Research Section" or the "Department's Materials and Research Section" shall mean "Authority" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

Materials and Research Laboratory. Any reference to "Materials and Research Laboratory" throughout the DelDOT Standard Specifications shall mean the "Authority's Laboratory".

Storm Water Section. Any reference to "Storm Water Section" shall mean "Authority" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

Traffic Safety Section. Any reference to "Traffic Safety Section" shall mean "Authority" as defined in Division 100 – General Provisions, of the DRBA Standard Specifications.

Any reference to **Section 104.08** shall be deleted and revised to **Subsection 104.07, Suspension of Work/Annulment of Contract**

Any reference to **Section 106.08** shall be deleted and revised to indicate **Subsection 106.09, Disposal of Unacceptable Materials**

……

NOTE: Any reference to a one hundred-level Section or Subsection expressed within the DelDOT Standard Specifications shall be defined as that Section or Subsection of the General Provisions (Section 100) of the DRBA Standard Specifications.

[End of Special Provisions - Part III]

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * * * * *

SPECIAL PROVISIONS - PART IV

ADDITIONAL TECHNICAL SPECIFICATIONS

The following clauses represent technical specifications which shall be added to Divisions 200 through 1000 of the *Delaware Department of Transportation ("DelDOT") Standard Specifications for Road and Bridge Construction*, dated June 2021, including any Standard Items and Special Provisions, as published on the DelDOT website ("DelDOT Standard Specifications").

In a case of conflicting requirements, this Part IV shall govern over:

(i) The DelDOT Standard Specifications, as defined above; and
(ii) Division 100 – General Provisions of the *Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction*, dated December 15, 2014; and
(iii) Part I of the Special Provisions provided herein; and
(iv) Part II of the Special Provisions provided herein; and
(v) Part III of the Special Provisions provided herein.

Any applicable provision set forth in the Standard Specifications that is not modified by or in conflict with the Special Provisions of Parts I-IV shall be understood to remain in full force and effect.

DIVISION 13: GENERAL ARCHITECTURAL
SECTION/DESCRIPTION
024110 Demolition
042000 Unit Masonry
061000 Rough Carpentry
064100 Architectural Wood Casework
064200 Wood Paneling
075300 Elastomeric Membrane Roofing
076200 Sheet Metal Flashing and Trim
079200 Joint Sealants
081213 Hollow Metal Frames
081416 Flush Wood Doors
088000 Glazing
092116 Gypsum Board Assemblies
093000 Tiling
095100 Acoustical Ceilings
096500 Resilient Flooring
096813 Tile Carpeting
099123 Interior Painting
101400 Signage
102641 Ballistics Resistant Panels
102800 Toilet, Bath and Laundry Accessories
123217 Console Furniture

SECTION 024100
DEMOLITION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.02 SUBMITTALS

A. Site Plan: Showing:

1. Areas for temporary construction and field offices.

2. Areas for temporary and permanent placement of removed materials.

B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 - PRODUCTS -- NOT USED

PART 3 - EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.

2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.

3. Provide, erect, and maintain temporary barriers and security devices.

4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

5. Do not close or obstruct roadways or sidewalks without permit.

6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property, and propose

measures for protecting individuals and property, for environmental protection and dust and noise control, if necessary.

B. Do not begin removal until receipt of notification to proceed from DRBA.

C. Protect existing structures and other elements that are not to be removed.

1. Provide bracing and shoring.

2. Prevent movement or settlement of adjacent structures.

3. Stop work immediately if adjacent structures appear to be in danger.

4. Strengthen or add new supports when required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain.

3.02 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least seven (7) days prior written notification to DRBA.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least three (3) days prior written notification to DRBA.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain. Indicate how long utility services, other than ones indicated to remain in service, will be interrupted.

3.03 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Plans showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.

2. Report discrepancies to Engineer before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and as required to accomplish new work.

1. Remove items as indicated on Plans.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.

2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

3. Verify that abandoned services serve only abandoned facilities before removal.

4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

D. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.

2. Perform cutting to accomplish removals neatly and as specified for cutting new work.

3. Repair adjacent construction and finishes damaged during removal work.

4. Patch as specified for patching new work.

3.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

3.05 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.06 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 024100

SECTION 042000

UNIT MASONRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Concrete block.

B. Mortar and grout.

C. Reinforcement and anchorage.

D. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 079200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.

B. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2016, with Editorial Revision (2018).

C. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2018a.

D. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2016a.

E. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2017.

F. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019.

G. ASTM C476 - Standard Specification for Grout for Masonry; 2019.

H. ASTM C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units; 2016.

I. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2016.

1.04 SUBMITTALS

A. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

B. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system. Detail bending, lap lengths, and placement of unit masonry reinforcing bars.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Handle and store ceramic glazed masonry units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:

1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depth of 6 inches (150 mm).

2. Non-Loadbearing Units: Comply with ASTM C129.

a. Hollow block, as indicated.

3. Pre-Faced Units: Comply with ASTM C90, hollow block, with manufacturer's standard smooth resinous facing complying with ASTM C744.

a. Colors and styles: As scheduled.

2.02 MORTAR AND GROUT MATERIALS

A. Water: Clean and potable.

B. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.

1. Color: Standard gray.

C. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.

2.03 REINFORCEMENT AND ANCHORAGE

A. Single Wythe Joint Reinforcement: Comply with ASTM A951/A951M.

1. Type: Truss or ladder.

2. Material: Comply with ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M, Class 3.

3. Size: 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.

B. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch (16 mm) of mortar coverage from masonry face.

2.04 ACCESSORIES

A. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self-expanding; in maximum lengths available.

B. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.05 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: Comply with ASTM C270, using the Proportion Specification.

1. Interior, loadbearing masonry: Type N.

B. Grout: Comply with ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).

C. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

D. For the record, prepare written report, endorsed by Installer, listing conditions affecting performance of the Work, if any.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:

1. Bond: Running.

2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).

3. Mortar Joints: Concave.

3.04 PLACING AND BONDING

A. Lay hollow masonry units with face shell bedding on head and bed joints.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Remove excess mortar and mortar smears as work progresses.

D. Interlock intersections and external corners, except for units laid in stack bond.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

G. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

H. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

I. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.05 REINFORCEMENT AND ANCHORAGE - GENERAL AND SINGLE WYTHE MASONRY

A. Unless otherwise indicated on Plans or specified under specific wall type, install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch (16 mm) mortar cover on each side.

E. Lap joint reinforcement ends minimum 6 inches (150 mm).

F. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches (400 mm) on center.

G. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on Plans or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches (900 mm) horizontally and 24 inches (600 mm) vertically.

H. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches (38 mm) with at least 5/8 inch (16 mm) mortar cover to the outside face of the anchor.

3.06 GROUTED COMPONENTS

A. Lap splices minimum 24 bar diameters.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.07 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

3.08 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft. (6 mm/3 m) and 1/2 inch in 20 ft. (13 mm/6 m) or more.

C. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft. (3 mm/m) and 1/4 inch in 10 ft. (6 mm/3 m); 1/2 inch in 30 ft. (13 mm/9 m).

E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).

F. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch (6 mm).

3.09 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.

3.10 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

3.11 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

3.12 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.13 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 042000

SECTION 061000

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Roof-mounted curbs.

B. Roofing nailers.

1.02 RELATED REQUIREMENTS – NOT USED

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

B. PS 20 - American Softwood Lumber Standard; 2020.

C. SPIB (GR) - Grading Rules; 2014.

1.04 SUBMITTALS

A. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

1.06 WARRANTY

A. Correct defective Work within a five-year period after date of substantial completion.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.

2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org), and who provides

grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc: SPIB (GR).

B. Sizes: Nominal sizes as indicated on Plans, S4S.

C. Moisture Content: S-dry or MC19.

D. Stud Framing [2 by 2 through 2 by 6 (50 by 50 mm through 50 by 150 mm)]:

1. Grade: No. 2.

E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 2 or Standard Grade.

2. Boards: Standard or No. 3.

2.03 ACCESSORIES

A. Fasteners and Anchors:

1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.02 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

3.03 CLEANING

A. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

B. Prevent sawdust and wood shavings from entering the storm drainage system.

3.04 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.05 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 061000

SECTION 064100

ARCHITECTURAL WOOD CASEWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Countertops.

C. Hardware.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

1.03 REFERENCE STANDARDS

A. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2017, with Errata (2019).

B. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1. Scale of Shop Drawings: 1-1/2 inch to 1 foot (125 mm to 1 m), minimum.

2. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

3. Include certification program label.

B. Product Data: Provide data for hardware accessories.

C. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches (300 mm) square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

D. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.07 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

B. Field measure conditions where woodwork is indicated to be fitted to other construction prior to fabricating work of this Section. Contractor is responsible for coordination of dimensions and field measurements required by trade contractors.

PART 2 - PRODUCTS

2.01 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Plastic Laminate Faced Cabinets: Custom grade.

C. Cabinets:

1. Finish - Exposed Exterior Surfaces: Decorative laminate.

2. Finish - Exposed Interior Surfaces: Decorative laminate.

3. Finish - Semi-Exposed Surfaces: Decorative laminate

4. Finish - Concealed Surfaces: Manufacturer's option.

5. Door and Drawer Front Edge Profiles: Square edge with thin applied band.

6. Door and Drawer Front Retention Profiles: Fixed panel.

7. Casework Construction Type: Type A - Frameless.

8. Interface Style for Cabinet and Door: Style 2 - Finish Inset; reveal overlay.

9. Cabinet Design Series: As indicated on Plans.

10. Adjustable Shelf Loading: 50 lbs. per sq. ft.

    a. Deflection: L/144.

11. Cabinet Style: Flush overlay.

12. Cabinet Doors and Drawer Fronts: Flush style.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 LAMINATE MATERIALS

A. Manufacturers:

1. Formica Corporation: www.formica.com/#sle
2. Wilsonart LLC: www.wilsonart.com/#sle
3. Or Approved Equal.

B. Provide specific types as indicated.

1. Horizontal Surfaces: PLAM-1, 0.039 inch (1.0 mm) nominal thickness, through color, color as selected, finish as indicated.
2. Vertical Surfaces: PLAM-2, 0.020 inch (0.51 mm) nominal thickness, through color, color as selected, finish as indicated.
3. Cabinet Liner: CLS, 0.020 inch (0.51 mm) nominal thickness, color as selected, finish as indicated.
4. Laminate Backer: BKL, 0.020 inch (0.51 mm) nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.04 COUNTERTOPS

A. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, conventionally fabricated and self-edge banded.

2.05 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Vinyl Countertop Edge: PVC anchor type tee-molding edging in width to match thickness of countertop, color as indicated, used at locations as indicated.

C. Fasteners: Size and type to suit application.

D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

E. Concealed Joint Fasteners: Threaded steel.

2.06 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using surface mounted metal shelf standards or multiple holes for pin supports and coordinated self-rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.

C. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers ("U" shaped wire pull, steel with chrome finish, 100 mm centers).

D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.

E. Hinges: Concealed (fully mortised) self-closing type, steel with polished finish.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.

1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.

2. Cap exposed plastic laminate finish edges with material of same finish and pattern.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use concealed joint fasteners to align and secure adjoining cabinet units.

D. Secure cabinets to floor using appropriate angles and anchorages.

E. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

3.05 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.06 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 064100

SECTION 064200

WOOD PANELING

PART 1 - GENERAL

1.01 SUBMITTALS

A. See DRBA Standard Specification Section 105.04 - Plans and Working Drawings.

B. Product Data: Provide data on fire-retardant treatment materials and application instructions.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

PART 2 - PRODUCTS

2.01 PANELING

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless otherwise indicated.

2.02 FABRICATION

A. Shop prepare and identify panels for grain matching during site erection.

B. Prepare panels for delivery to site, permitting passage through building openings.

C. Finish exposed edges of panels as specified by grade requirements.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Do not begin installation until wood materials have been fully acclimated to interior conditions.

C. Set and secure materials and components in place, plumb and level, using concealed fasteners wherever possible.

3.02 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.03 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 064200

SECTION 075300

ELASTOMERIC MEMBRANE ROOFING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Elastomeric roofing membrane, adhered conventional application.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Wood nailers and curbs.

1.03 REFERENCE STANDARDS

A. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015.

B. NRCA (WM) - The NRCA Waterproofing Manual; 2005.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of associated counter flashings installed under other sections.

B. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

A. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.

B. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.

C. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

D. Warranty: Submit manufacturer warranty and ensure forms have been completed in DRBA's name and registered with manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.

B. Store materials in weather protected environment, clear of ground and moisture.

C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

D. Protect foam insulation from direct exposure to sunlight.

1.07 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

D. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.08 WARRANTY

A. Correct defective Work within a two year period after date of substantial completion.

B. Provide 30 year manufacturer's material and labor warranty to cover failure to prevent penetration of water, damage due to wind, or other natural causes.

PART 2 - PRODUCTS

2.01 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: Fully-adhered Ethylene-propylene-diene-monomer (EPDM); externally reinforced with fabric; complying with minimum properties of ASTM D4637/D4637M and 30 year warranty requirements.

1. Thickness: 0.090 inch (90 mil)

2. Color: Match existing.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Membrane Fasteners: As recommended by and approved by membrane manufacturer.

D. Flexible Flashing Material: Same material as membrane.

2.02 ACCESSORIES

A. Membrane Adhesive: As recommended by membrane manufacturer.

B. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

C. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.

D. Sealants: As recommended by membrane manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 MEMBRANE APPLICATION

A. Install elastomeric membrane roofing system in accordance with manufacturer's recommendations and NRCA (WM) applicable requirements.

B. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

C. Shingle joints on sloped substrate in direction of drainage.

D. Spot Adhered Application: Mechanically fasten adhesion discs to substrate. Apply adhesive to discs and bond membrane. Fully adhere one roll before proceeding to adjacent rolls.

E. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (75 mm). Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

F. At intersections with vertical surfaces:

1. Extend membrane over cant strips and up a minimum of 4 inches (100 mm) onto vertical surfaces.

2. Fully adhere flexible flashing over membrane and up to nailing strips.

3. Secure flashing to nailing strips at 4 inches (100 mm) on center.

G. Around roof penetrations, seal flanges and flashings with flexible flashing.

H. Coordinate installation of roof drains and sumps and related flashings.

3.03 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.04 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

3.05 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.06 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 075300

SECTION 076200

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Sealants for joints within sheet metal fabrications.

1.02 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2019a.

B. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2012 (Reapproved 2019).

C. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products; 2014.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).

F. CDA A4050 - Copper in Architecture - Handbook; current edition.

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.03 SUBMITTALS

A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Maintain one (1) copy of each document on site.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 - PRODUCTS

2.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) (0.61 mm) thick base metal.

B. Lead Sheet: ASTM B749, 0.047 inch (1.19 mm) minimum thickness; UNS Number L51121.

C. Copper: ASTM B370, cold rolled 16 oz/sq ft (24 gage) (0.0216 inch) (0.55 mm) thick; natural finish.

2.02 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.

F. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

2.03 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Primer: Zinc chromate type.

C. Concealed Sealants: Non-curing butyl sealant.

D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

E. Plastic Cement: ASTM D4586/D4586M, Type I.

F. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

3.03 INSTALLATION

A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

B. Apply plastic cement compound between metal flashings and felt flashings.

C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

D. Seal metal joints watertight.

3.04 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.05 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 076200

SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

A. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2018.

B. ASTM C834 - Standard Specification for Latex Sealants; 2017.

C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2018.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

G. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2018.

1.03 SUBMITTALS

A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.

2. List of backing materials approved for use with the specific product.

3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.

4. Substrates the product should not be used on.

5. Substrates for which use of primer is required.

6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.

7. Sample product warranty.

B. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Preconstruction Laboratory Test Reports: Submit at least four (4) weeks prior to start of installation.

1.04 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.

1. Adhesion Testing: In accordance with ASTM C794.

2. Compatibility Testing: In accordance with ASTM C1087.

3. Allow sufficient time for testing to avoid delaying the work.

4. Deliver to manufacturer sufficient samples for testing.

5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

1.05 WARRANTY

A. Correct defective work within a five-year period after date of substantial completion.

B. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 - PRODUCTS

2.01 NONSAG JOINT SEALANTS

A. Type 1 - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.

2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.

3. Color: Match adjacent finished surfaces.

B. Type 2 - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.

1. Color: To be selected by Engineer from manufacturer's standard range.

2. Grade: ASTM C834; Grade Minus 18 Degrees C (0 Degrees F).

3. Manufacturers:

a. Pecora Corporation; AC-20 +Silicone: www.pecora.com/#sle

b. Approved equal.

C. Type 3 - Acrylic Latex Sealant: ASTM C834; for use as acoustical sealant and in firestopping systems for expansion joints and through penetrations.

1. Color: To be selected by Engineer from manufacturer's standard range.

2. Manufacturers:

a. Pecora Corporation; AC-20 FTR (Fire and Temperature Rated): www.pecora.com/#sle

b. Approve equal.

2.02 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials. Cleaner shall be free of any oily residues or other substrates capable of staining or harming the integrity of joint substrates and adjacent non-porous surfaces in any way.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install bond breaker backing tape where backer rod cannot be used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.05 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 079200

SECTION 081213

HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Non-fire-rated hollow metal frames for non-hollow metal doors.

B. Bullet-resistant hollow metal frames for non-hollow metal doors.

1.2 RELATED REQUIREMENTS

A. Section 081416 - Flush Wood Doors: Non-hollow metal door for hollow metal frames.

B. Section 087100 - Door Hardware: Hardware, silencers, and weatherstripping.

C. Section 088000 - Glazing: Glazed borrowed lites.

1.3 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2019a.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2018.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.

H. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

J. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

K. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

L. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2007.

M. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.

N. NAAMM HMMA 862 - Guide Specifications for Commercial Security Hollow Metal Doors and Frames; 2013.

O. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.

P. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one (1) copy of standards-referenced grading.

B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store in accordance with applicable requirements and in compliance with standards and/or custom guidelines as indicated.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory-applied painted finish.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Hollow Metal Frames:

1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle

2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle

3. Republic Doors, an Allegion brand: www.republicdoor.com/#sle

4. Steelcraft, an Allegion brand: www.allegion.com/#sle

5. Approved equal.

B. Bullet-Resistant Hollow Metal Frames:

1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle

2. Republic Doors, an Allegion brand: www.republicdoor.com/#sle

3. Total Security Solutions: www.tssbulletproof.com

4. Approved Equal.

2.2 PERFORMANCE REQUIREMENTS

A. Door Frame Type: Provide hollow metal door frames with integral casings.

B. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.

C. Accessibility: Comply with ICC A117.1 and ADA Standards.

D. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior frame that is also indicated as being sound-rated must comply with the requirements specified for exterior frames and for sound-rated frames; where two requirements conflict, comply with the most stringent.

E. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115, NAAMM HMMA 830, NAAMM HMMA 831 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

2.3 HOLLOW METAL DOOR FRAMES WITH INTEGRAL CASINGS

A. Frame Finish: Factory primed and field finished.

B. Interior Door Frames, Non-Fire Rated: Knock-down type.

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

a. Level 2 - Heavy-duty.

b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.

c. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.

C. Bullet-Resistant Door Frames: Face welded type.

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

    a. Level 2 - Heavy-duty.

    b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.

    c. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.

2. Commercial Security Rating Impact Testing: Comply with forced entry, static load, and soft or hard body impact testing for Class 1 in accordance with NAAMM HMMA 862 requirements.

3. Bullet-Resistance: UL 752, Threat Level Rating - Level 2.

4. Hinge Rail and Reinforcement: Non-beveled edge, reinforced with continuous steel channel, 12 gage, 0.093 inch (2.3 mm) minimum metal thickness, welded at 5 inch (127 mm) on center maximum, and compatible with 4-1/2 inch (114 mm) full mortise template and continuous geared hinges.

2.4 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.5 ACCESSORIES

A. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

B. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.2 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.3 INSTALLATION

A. Install frames in accordance with manufacturer's instructions and related requirements of specified frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.

C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Comply with glazing installation requirements of Section 088000.

E. Install door hardware as specified in Section 087100.

F. Coordinate installation of electrical connections to electrical hardware items.

3.4 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edges, crossed corner to corner.

3.5 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.6 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 081213

SECTION 081416

FLUSH WOOD DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush configuration; non-rated.

1.02 RELATED REQUIREMENTS

A. Section 081213 - Hollow Metal Frames.

B. Section 087100 - Door Hardware.

C. Section 099300 - Staining and Transparent Finishing: Field finishing of doors.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2018).

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2017, with Errata (2019).

C. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

B. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

C. Samples: Submit two (2) samples of door veneer, 4 x 4 inches in size, illustrating wood grain, stain color, and sheen.

D. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

E. Test Reports: Show compliance with specified requirements for the following:

1. Bullet resistant doors and frames.

F. Warranty, executed in DRBA's name.

1.05 QUALITY ASSURANCE

A. Maintain one (1) copy of the specified door quality standard on site for review during installation and finishing.

B. Quality Certification:

1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.

2. Provide designated labels on Shop Drawings as required by certification program.

3. Provide designated labels on installed products as required by certification program.

4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY

A. Interior Doors: Provide manufacturer's warranty for two (2) years.

B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:

1. Graham Wood Doors: https://architectural.masonite.com/graham-maiman/products/

2. Oregon Door: www.oregondoor.com/#sle

3. VT Industries, Inc: www.vtindustries.com/#sle

4. Approved equal.

B. Bullet Resistant Wood Doors:

1. Overly Door Company: www.overly.com/#sle

2. Total Security Solutions: www.tssbulletproof.com

3. Approved equal.

2.02 DOORS AND PANELS

A. Doors: Refer to Plans for locations and additional requirements.

1. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.

1. Provide solid core doors at each location.

2. Wood veneer facing for field transparent finish as indicated on Plans.

C. Security Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.

1. Provide solid core doors at each location.

2. Bullet Resistant Doors: UL 752, Level 2.

3. Wood veneer facing for field transparent finish as indicated on Plans.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type staved lumber core (SLC), plies and faces as indicated.

B. Bullet Resistant Doors: Equivalent to type, with bonded staved lumber core (SLC); rating; plies and faces as indicated above.

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Red oak, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.

1. Vertical Edges: Any option allowed by quality standard for grade.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

1. Provide solid blocks at lock edge for hardware reinforcement.

2. Provide solid blocking for other through-bolted hardware.

C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

D. Factory fit doors for frame opening dimensions identified on Shop Drawings, with edge clearances in accordance with specified quality standard.

E. Provide edge clearances in accordance with the quality standard specified.

2.06 FACTORY FINISHING - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

1. Transparent:

a. System - 1, Lacquer, Nitrocellulose.

b. Stain: As selected by Engineer.

c. Sheen: Flat.

B. Factory finish doors in accordance with sample to be provided.

C. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

A. Hollow Metal Door Frames: As specified in Section 081213.

B. Door Hardware: As specified in Section 087100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

3.05 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.06 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 081416

SECTION 088000

GLAZING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Plastic film for bullet resistant glazing system.

C. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 079005 - Joint Sealers: Sealant and back-up material.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2010.

C. ASTM C1036 - Standard Specification for Flat Glass; 2016.

D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

E. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

G. ASTM C1499-09 - Monotonic Equibiaxial Flexural Strength of Glass (Double Ring Test).

H. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting.

I. STM D1044 - Test method for Resistance of Transparent Plastics to Surface Abrasion.

J. ASTM D3330 - Standard Test Methods for Peel-Adhesion at 180 Degree Angle.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2019b.

L. ASTM E 773 - Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units; 2001.

M. ASTM E 774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units; 1997.

N. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.

O. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.

P. ASTM Z97.1 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

Q. GANA (GM) - GANA Glazing Manual; 2009.

R. GANA (SM) - GANA Sealant Manual; 2008.

S. GANA (LGRM) - Laminated Glazing Reference Manual; 2009.

T. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2004).

U. Consumer Product Safety Commission (CPSC) 16CFR 1201 - Safety Standard for Architectural Glazing Materials.

V. National Institute of Justice Standard NIJ-STD-0108.01.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. See Section 01 33 00 - Submittal Procedures.

C. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

D. Samples: Submit two (2) samples of glass units, 6 x 6 inches in size, showing coloration and design.

E. Certificates: Certify that products meet or exceed specified requirements.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.

1.07 MOCK-UP

A. See Section 014000 - Quality Requirements, for additional mock-up requirements.

B. Construct a mock-up panel of size, detail and configuration indicated on the Plans. Mock-up shall include all components of the exterior wall construction.

1.08 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F (10 degrees C).

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.09 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.

C. Bullet Resistant Film: Manufacturer's standard warranty agreeing to replace films that fail within 10 years from date of substantial completion.

1.10 PERFORMANCE REQUIREMENTS

A. General: Provide glass capable of withstanding thermal movement and wind and impact loads (where applicable) as specified in paragraph B following.

B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:

1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:

a. Basic Wind Speed: 120 mph.

C. Thermal Movements: Provide glazing that allows for thermal movements resulting from ambient and surface temperatures changes acting on glass framing members and glazing components.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 1/4 inch (6.0 mm) thick.

2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.

3. Center-of-Glass Values: Based on using LBL-44789 WINDOW 5.0 computer program for the following methodologies:

   a. U-Factors: NFRC 100 expressed as Btu/ sq. ft. per h per degree F.

   b. Solar Heat Gain Coefficient: NFRC 200.

   c. Solar Optical Properties: NFRC 300.

PART 2 - PRODUCTS

2.01 BASIS OF DESIGN - BULLET RESISTANT INSULATING AND NON-INSULATING GLASS UNITS

A. Type G1 - Bullet Resistant, Non-Insulating Glass Units: Vision glazing.

1. Substitutions: Approved Equal.

2. Overall Unit Thickness: 5/8”, bullet resistant laminated glass.

   a. UL Laboratories, UL-752, Level II Ballistic Resistance.

   b. Laminated glass:

      1) 1/4 inch annealed, clear.

      2) Kuraray, Trosifol SentryGlas interlayer: 0.89 mm (35 mil).

      3) ¼” inch annealed, clear.

      4) Three layers, C-Bond BRS.

   c. Glazing panels shall be preassembled and laminated prior to shipment to the project site.

3. Tint: Clear.

2.02 GLASS MATERIALS

A. Float Glass Manufacturers:

1. Guardian Industries Corp: www.guardianglass.com

2. Pilkington North America Inc: www.pilkington.com/na

3. Vitro Architectural Glass: https://www.vitroglazings.com/

4. Substitutions: Refer to Section 016000 - Product Requirements.

B. Float Glass: All glazing is to be float glass unless otherwise indicated.

1. Heat-Strengthened and Fully Tempered Types: ASTM C1048.

2. Tinted Types: Color and performance characteristics as indicated.

3. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.

C. Laminated Glass: Float glass laminated in accordance with ASTM C1172.

1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.

2. Plastic Interlayer:

a. As indicated in paragraph 2.01.

2.03 BULLET RESISTANT FILMS

A. Bullet Resistant Film:

1. Bullet Resistant - Basis of Design: C-Bond BRS, Level 2.

2. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Performance Requirements:

1. Thermal and Optical Performance Properties: Provide glazing films that will not affect the thermal and optical performance characteristics as established by the glass components scheduled for storefront and window systems.

2. Color: Clear.

3. Flexural Glass Strength: When tested in accordance with ASTM C-1499-09, Monotonic Equibiaxial Flexural Strength of Glass (Double Ring Test), the application of the mounting fluid alone shall strengthen the glass to percentages up to and over 250 percent, and improve the flexural properties of the glass to percentages up to and over 130 percent.

C. Film Accessories:

1. General: Provide products complying with requirements of glazing film manufacturer for application indicated and with a proven record of compatibility with surfaces contacted in installation.

2. Adhesive: Types recommended by glazing film manufacturer and nano-technology fluid manufacturer.

3. Cleaners, Primers, and Sealers: Types recommended by glazing film manufacturer.

D. Anchor System:

1. Provide transfer adhesive and mechanical anchor at edges of film to secure film, as recommended by the nano-technology fluid manufacturer and as described below:

a. DOW 995 Structural Silicone adhesive (or equivalent alternative approved by film manufacturer) to be used for all anchoring of film to window frame/glazing system.

1) Dow Corning 995 Silicone Structural Glazing Sealant is a one-component, neutral-curing, silicone sealant designed specifically for structural bonding applications of glass and metal in factory or field situations.

2) Minimum bead of 1/2 inch overlapping the exposed edge of the security film, and 1/2 inch overlapping the window frame/glazing system shall be used on all installations. Silicone bead installation may vary based on glazing system.

3) Structural adhesive color to be black, white or grey as selected by the Engineer.

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C864 Option I. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self-adhesive on one face.

C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.

1. Thickness: As required for application.

2. Manufacturers:

a. Pecora Corporation: www.pecora.com

b. Substitutions: Refer to Section 016000 - Product Requirements.

2.05 SOURCE QUALITY CONTROL AND TESTS

A. Provide shop inspection and testing for all glass.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)

A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.

C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

D. Place glazing tape on free perimeter of glazing in same manner described above.

E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

F. Knife trim protruding tape.

3.04 INSTALLATION - BULLET RESISTANT FILM

A. Examine glass and surrounding adjacent surfaces for conditions affecting installation.

1. Report conditions that may adversely affect installation. Include description of any glass that is broken, chipped, cracked, abraded, or damaged in any way.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3. Beginning of installation means acceptance of conditions.

B. Preparation:

1. Comply with manufacturer's written instructions for surface preparation.

2. Immediately before beginning installation of films, clean glass surfaces of substances that could impair glazing film's bond, including mold, mildew, oil, grease, dirt, and other foreign materials.

3. Protect window frames and surrounding conditions from damage during installation.

C. Installation:

1. Comply with glazing film manufacturer's written installation instructions, except where more stringent requirements apply.

2. Clean glass surface with a typical household glass cleaner to remove debris and dry with a paper towel. Apply alcohol on the glass surface to remove any moisture and remove with a squeegee or paper towel.

3. Install film using a non-technology mounting fluid.

4. Use dedicated spray bottle or pressurized tank to apply the nano-technology mounting fluid.

5. If the nano-technology fluid sits idle for more than 60 minutes, slightly agitate it by rocking the spray bottle or pressurized tank from side to side for ± 5 seconds.

6. Apply nano-technology mounting fluid as follows:

a. Hold spray bottle or pressurized tank nozzle approximately 8-10 inches from the glass surface.

b. Apply the nano-technology fluid to equally cover the entire glass surface area.

7. Custom cut film to the glass with neat, square corners and edges to within 1/8 inch of the window frame.

8. Do not remove release liner from film until just before each piece of film is cut and ready for installation.

9. Install film continuously. Install with no gaps.

10. Install film absent of bubbles, wrinkles, blisters, edge lifting and blemishes.

11. After installation, view film from a distance of 10 feet against a bright uniform sky or background. Film shall appear uniform in appearance with no visible streaks, banding, thin spots or pinholes. If installed film does not meet this criteria, remove and replace with new film.

D. Care and Cleaning:

1. Remove excess mounting fluid at finished seams, perimeter edges, and adjacent surfaces.

2. Use cleaning methods recommended by glazing film manufacturer.

3. Replace films that cannot be cleaned.

4. Clean installed film with approved cleaners only. Contact nano-technology manufacturer for approved cleaning fluids.

3.05 MANUFACTURER'S FIELD SERVICES

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.06 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.07 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.08 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 088000

SECTION 092116

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Metal stud wall framing.

B. Metal channel ceiling framing.

C. Resilient sound isolation clips.

D. Acoustic insulation.

E. Gypsum wallboard.

F. Joint treatment and accessories.

1.2 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.

1.3 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017.

B. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2018.

C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2018.

D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2019b.

E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2018.

F. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2019.

G. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.

H. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

I. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2019b.

K. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

1.04 SUBMITTALS

A. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

B. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.1 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:

1. ClarkDietrich: www.clarkdietrich.com/#sle

2. SCAFCO Corporation: www.scafco.com/#sle

3. Approved equal.

B. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).

1. Studs: “C” shaped with knurled or embossed faces.

2. Runners: U shaped, sized to match studs.

3. Ceiling Channels: C-shaped.

4. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).

5. Resilient Furring Channels: Single or double leg configuration; 1/2 inch (12 mm) channel depth.

a. Products:

1) Same manufacturer as other framing materials.

6. Resilient Sound Isolation Clips: Steel resilient clips with molded rubber isolators, attaches to framing; improves noise isolation performance of wall and floor-ceiling assemblies.

C. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and braced with continuous bridging both sides.

D. Non-structural Framing Accessories:

1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

2. Flexible Wood Backing: Fire-retardant-treated wood with sheet steel connectors.

a. Products:

1) ClarkDietrich; Danback: www.clarkdietrich.com/#sle

2) Approved equal.

2.2 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Use for vertical surfaces, unless otherwise indicated.

2. Thickness:

a. Vertical Surfaces: 5/8 inch (16 mm).

b. Ceilings: 1/2 inch (13 mm).

3. Paper-Faced Products:

a. CertainTeed Corporation; Type X Drywall: www.certainteed.com/#sle

b. USG Corporation; USG Sheetrock Brand Firecode X Panels: www.usg.com/#sle

c. Approved equal.

B. Abuse Resistant Wallboard:

1. Application: High-traffic areas indicated.

2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

3. Thickness: 5/8 inch (16 mm).

4. Edges: Tapered.

5. Paper-Faced Products:

a. CertainTeed Corporation; Extreme Abuse Resistant Drywall with M2Tech.

b. Approved equal.

C. Backing Board For Wet Areas:

1. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.

a. Fire-Resistance-Rated Type: Type X core, thickness 5/8 inch (16 mm).

b. Products:

1) CertainTeed Corporation; Diamondback 5/8" Type X Tile Backer: www.certainteed.com/#sle

2) Georgia-Pacific Gypsum; DensShield Tile Backer: www.gpgypsum.com/#sle

3) National Gypsum Company; Gold Bond eXP Tile Backer: www.nationalgypsum.com/#sle

4) Substitutions: See Section 016000 - Product Requirements.

D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Ceilings, unless otherwise indicated.

2. Thickness: 1/2 inch (13 mm).

3. Edges: Tapered.

4. Products:

a. CertainTeed Corporation; Interior Ceiling Drywall.

b. Approved equal.

2.3 GYPSUM WALLBOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: As indicated on the Plans.

B. Sound Isolation Tape: Elastomeric foam tape for sound decoupling.

1. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2. Tape Thickness: 1/4 inch (6 mm).

C. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

D. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.

1. Corner Beads: Low profile, for 90 degree outside corners.

2. L-Trim with Tear-Away Strip: Sized to fit 1/2 inch (13 mm) thick gypsum wallboard.

E. Moisture Guard Trim: ASTM C1047, rigid plastic, 48 inch (1219.2 mm) length, applied to bottom edge of gypsum board.

F. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

1. Fiberglass Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners, except as otherwise indicated.

2. Joint Compound: Drying type, vinyl-based, ready-mixed.

G. Finishing Compound: Surface coat and primer, takes the place of skim coating.

H. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

I. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.2 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

C. Studs: Space studs at 16 inches on center (at 406 mm on center).

1. Extend partition framing to structure where indicated and to ceiling in other locations.

2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

3. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches (100 mm) from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches (600 mm) on center.

F. Blocking: Install wood blocking for support of:

1. Plumbing fixtures.

2. Toilet accessories.

3. Wall-mounted door hardware.

3.3 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.

C. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.4 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.

3.5 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

D. Moisture Guard Trim: Install on bottom edge of gypsum board according to manufacturer's instructions and in locations indicated on Plans.

3.6 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use fiberglass joint tape, embed with drying type joint compound and finish with drying type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

2. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.7 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

3.8 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.9 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL

ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 092116

SECTION 093000

TILING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Stone thresholds.

1.0 RELATED REQUIREMENTS

1.3 REFERENCE STANDARDS

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017.

B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2017.

C. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2016).

D. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship; 2019.

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).

F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017.

K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2016).

M. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2017.

N. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2010 (Reaffirmed 2016).

O. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2012.

P. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2012.

Q. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2019.

1.4 SUBMITTALS

A. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

B. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches (457 by 457 mm) in size illustrating pattern, color variations, and grout joint size variations.

C. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

D. Maintenance Materials: Furnish the following for DRBA's use in maintenance of project.

1. Extra Tile: 10 square feet (1 square meters) of each size, color, and surface finish combination.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.6 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

PART 2 PRODUCTS

2.1 TILE

A. Glazed Wall Tile, Type CT-1: ANSI A137.1, standard grade.

1. Size: 4 by 12 inch
2. Edges: Cushioned.
3. Surface Finish: Matte glaze.
4. Color(s): To be selected by Engineer from manufacturer's standard range.
5. Pattern: Brick.
6. Trim Units: Matching bullnose shapes in sizes coordinated with field tile.
7. Products:
    a. Dal-Tile Corporation; Color Wheel Collection - Linear: www.daltile.com/#sle
    b. Approved equal..

B. Porcelain Floor Tile, Type CT-2: ANSI A137.1, standard grade.

1. Size: 12 by 12 inch (305 by 305 mm), nominal.
2. Surface Finish: Matte glazed.
3. Color(s): To be selected by Engineer from manufacturer's standard range.
4. Pattern: Brick.
5. Trim Units, Type CT-3: Matching bullnose, cove base, and cove shapes in sizes coordinated with field tile.
6. Products:
    a. Dal-Tile Corporation; Unity: www.daltile.com/#sle
    b. Approved equal.

2.2 TRIM AND ACCESSORIES

A. Thresholds: 2 inches (51 mm) wide by full width of wall or frame opening; beveled edge on both long edges; without holes, cracks, or open seams.

1. Material: Solid surface acrylic resin, mineral filler, and pigments; non-porous, color and pattern consistent throughout thickness.
2. Applications:
    a. At doorways where tile terminates.

2.3 SETTING MATERIALS

A. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.

1. Products:

a. Custom Building Products; MegaLite Ultimate Crack Prevention Large Format Tile Mortar: www.custombuildingproducts.com/#sle

b. LATICRETE International, Inc.; LATICRETE 254 Platinum: www.laticrete.com/#sle

c. Approved equal.

2.4 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. Standard Grout: ANSI A118.6 standard cement grout.

1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.

2. Use sanded grout for joints 1/8 inch (3.2 mm) wide and larger; use unsanded grout for joints less than 1/8 inch (3.2 mm) wide.

3. Products:

a. LATICRETE International, Inc.; LATICRETE 1500 Sanded Grout: www.laticrete.com/#sle

b. Approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).

1. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.

3.2 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.3 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.19 , manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install thresholds where indicated.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.4 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.

3.5 INSTALLATION - WALL TILE

A. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.6 CLEANING

A. Clean tile and grout surfaces.

3.7 PROTECTION

A. Do not permit traffic over finished floor surface for four (4) days after installation.

3.8 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.9 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 093000

SECTION 095100

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.2 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.

B. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2019.

1.3 SUBMITTALS

A. Product Data: Provide data on suspension system components and acoustical units.

B. Maintenance Materials: Furnish the following for DRBA's use in maintenance of project.

1. See Section 016000 - Product Requirements, for additional provisions.

2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

PART 2 PRODUCTS

2.1 ACOUSTICAL UNITS

A. Acoustical Panels: Painted mineral fiber, with the following characteristics:

1. Classification: ASTM E1264 Type III.

2. Size: 24 by 48 inch (610 by 1219 mm).

3. Thickness: 3/4 inch (19 mm).

4. Panel Edge: Square.

5. Suspension System: Exposed grid.

6. Products:

a. Armstrong World Industries, Inc; Fine Fissured: www.armstrongceilings.com/#sle

b. USG Corporation; Fissured Basic Acoustical Panels: https://www.usg.com/content/usgcom/en/products/ceilings/ceiling-tiles-panels/acoustical-panels/fissured-basic-acoustical-panels.560.html

c. Approved Equal.

2.2 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.

B. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.

1. Structural Classification: intermediate-duty, when tested in accordance with ASTM C635/C635M.

2. Profile: Tee; 15/16 inch (24 mm) face width.

3. Finish: Baked enamel.

4. Color: White.

5. Products:

a. USG Corporation; Donn Brand DX/DXL 15/16 inch Acoustical Suspension System: https://www.usg.com/content/usgcom/en/products/ceilings/grids-trim/acoustical-suspension-systems/donn-dx-dxl-acoustical-suspension-system.html

b. Armstrong World Industries, Inc.; PRELUDE XL 15/16” Exposed Tee: www.armstrongceilings.com/#sle

c. Approved Equal.

2.3 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12-gage 0.08 inch (2 mm) galvanized steel wire.

C. Hold-Down Clips: Manufacturer's standard clips to suit application.

D. Perimeter Moldings: Same metal and finish as grid.

1. Angle Molding: L-shaped, for mounting at same elevation as face of grid.

2. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.

E. Acoustical Insulation: ASTM C665, friction fit type, unfaced batts.

1. Thickness: 2 inch (51 mm).

2. Size: To fit acoustical suspension system.

F. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.2 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

3.3 INSTALLATION - SUSPENSION SYSTEM

A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

B. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.

1. Use longest practical lengths.

C. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

F. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.

G. Do not eccentrically load system or induce rotation of runners.

3.4 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:

1. Make field cut edges of same profile as factory edges.

F. Where round obstructions occur, provide preformed closures to match perimeter molding.

G. Lay acoustical insulation for a distance of 48 inches (1219 mm) either side of acoustical partitions.

3.5 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.6 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.7 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 095100

SECTION 096500

RESILIENT FLOORING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Resilient base.

B. Installation accessories.

1.2 RELATED REQUIREMENTS

1.3 REFERENCE STANDARDS

A. ASTM F1861 - Standard Specification for Resilient Wall Base; 2016.

1.4 SUBMITTALS

A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

B. Selection Samples: Submit manufacturer's complete set of color samples for Engineer's initial selection.

C. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

D. Maintenance Materials: Furnish the following for DRBA's use in maintenance of project.

1. See Section 016000 - Product Requirements, for additional provisions.

2. Extra Wall Base: 5 linear feet (1.5 linear meters) of each type and color.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).

PART 2 - PRODUCTS

2.1 RESILIENT BASE

A. Resilient Base - Type RB-1: ASTM F1861, Type TP, rubber, thermoplastic; top set Style B, Cove.

1. Manufacturers:

a. Burke Flooring; Commercial Wall Base - TS: www.burkeflooring.com/#sle

b. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle

c. Roppe Corp: www.roppe.com/#sle

d. Approved Equal.

2. Height: 4 inch (100 mm).

3. Thickness: 0.125 inch (3.2 mm).

4. Finish: Satin.

5. Color: To be selected by Engineer from manufacturer's full range.

6. Accessories: Pre-molded external corners and internal corners.

2.2 ACCESSORIES

A. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

B. Filler for Coved Base: Plastic.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

3.2 PREPARATION

A. Clean substrate.

B. Apply primer as required to prevent “bleed-through” or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Adhesive-Applied Installation:

1. Spread only enough adhesive to permit installation of materials before initial set.

2. Fit joints and butt seams tightly.

3.4 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

C. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.6 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.7 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 096500

SECTION 096813

TILE CARPETING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Carpet tile, loose laid with edges and control grid adhered.

B. Removal of existing carpet tile.

1.2 RELATED REQUIREMENTS

1.3 REFERENCE STANDARDS

1.4 SUBMITTALS

A. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

B. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

C. Maintenance Materials: Furnish the following for DRBA's use in maintenance of project.

1. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.5 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Tile Carpeting:

1. Interface, Inc: www.interface.com/#sle

2. Milliken & Company: www.milliken.com/#sle

3. Mohawk Group: www.mohawkgroup.com/#sle

4. Tarkett: https://commercial.tarkett.com/en_US/

5. Approved Equal

2.2 MATERIALS

A. Tile Carpeting, Type CPT-1: Tufted, manufactured in one color dye lot.

1. Basis of Design Product: Journal Inscription manufactured by Milliken & Company.

2. Tile Size: 18" by 36" inch (457.2 by 914.4 mm), nominal.

3. Color: To be determined.

2.3 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Edge Strips: Embossed aluminum, color as selected by Engineer.

C. Adhesives:

1. Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI (GLP) certified; in lieu of labeled product, independent test report showing compliance is acceptable.

D. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove existing carpet tile.

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

C. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.

D. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

E. Vacuum clean substrate.

3.2 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.

F. Locate change of color or pattern between rooms under door centerline.

G. Adhere carpet tile to substrate along centerline of rooms, at perimeter of rooms, where tiles are cut, and at 15 foot (4.5 m) intervals throughout rooms. Lay remainder of tile dry over substrate.

H. Trim carpet tile neatly at walls and around interruptions.

I. Complete installation of edge strips, concealing exposed edges.

3.3 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

3.4 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.5 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 096813

SECTION 099123

INTERIOR PAINTING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

D. Do Not Paint or Finish the Following Items:

1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.

2. Items indicated to receive other finishes.

3. Items indicated to remain unfinished.

4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.

5. Floors, unless specifically indicated.

6. Glass.

7. Concealed pipes, ducts, and conduits.

1.2 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.3 SUBMITTALS

A. Product Data: Provide complete list of products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. “alkyd enamel”).

2. MPI product number (e.g. MPI #47).

3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

B. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

C. Maintenance Materials: Furnish the following for DRBA's use in maintenance of project.

1. See Section 016000 - Product Requirements, for additional provisions.

2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; from the same product run, store where directed.

3. Label each container with color in addition to the manufacturer's label.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.5 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply materials when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces.

D. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 - PRODUCTS

2.1 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.

1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

2. Supply each paint material in quantity required to complete entire project's work from a single production run.

3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:

1. Provide paints and finishes that comply with the most stringent requirements specified in the following:

a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

2.2 PAINT SYSTEMS - INTERIOR

A. PT-1 and PT-2 Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board and plaster.

1. Two top coats and one coat primer.

2. Top Coat(s): High Performance Architectural Interior Latex; MPI #138, 139, 140, or 141.

a. Products:

1) Sherwin-Williams ProMar 200 HP Series, Eg-Shel. (MPI #139)

2) Approved Equal.

B. PT-3 Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:

1. Medium duty applications include doors and door frames.

2. Two top coats and one coat primer.

3. Top Coat(s): Interior Alkyd, Water Based; MPI #167, 168, or 169.

a. Products:

1) Sherwin-Williams ProMar 200 Water based Acrylic-Alkyd, Semi-Gloss.

2) Approved Equal.

C. PT-4 Medium Duty Overhead: Including gypsum board and plaster.

1. Two top coats and one coat primer.

2. Top Coat(s): Institutional Low Odor/VOC Interior Latex; MPI #143, 144, 145, 146, 147, or 148.

a. Products:

1) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Flat.

2) Approved Equal.

2.3 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.

1. Bonding Primer, Latex;

a. Products:

1) Sherwin-Williams Extreme Bond Primer.

2) Approved Equal

2. Water-Borne Synthetic Resin Based Primer

a. Products:

1) MAPEI Corporation Eco Prim Grip.

2) Approved Equal

2.4 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

C. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Gypsum Wallboard: 12 percent.

2. Plaster and Stucco: 12 percent.

3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Masonry:

1. Prepare surface as recommended by top coat manufacturer.

F. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

G. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

H. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

I. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

3.3 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions and recommendations in “MPI Architectural Painting Specification Manual”.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

F. Sand wood and metal surfaces lightly between coats to achieve required finish.

G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.5 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after substantial completion.

3.6 COLOR SCHEDULE

A. PT-1 Field Wall Color

1. Color to be determined.

B. PT-2 Accent Wall Color

1. Color to be determined.

C. PT-3 All Hollow Metal Frame

1. Color to match existing frames and trim.

D. PT-4 Gypsum Board Ceiling

1. Walls - #1234 green.

3.7 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.8 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 099123

SECTION 101400

SIGNAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Room and door signs.

1.2 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.3 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

1. When/If room numbers to appear on signs differ from those listed on Plans, include the plan sheet number and room number on the schedule.

2. When content of signs is indicated to be determined later, request such information from DRBA through Engineer at least two (2) months prior to start of fabrication; upon request, submit preliminary schedule.

3. Submit for approval by DRBA through Engineer prior to fabrication.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.5 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 - PRODUCTS

2.1 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.

1. Sign Type: Flat signs with engraved panel media as specified.

2. Provide “tactile” signage, with letters raised minimum 1/32 inch (0.8 mm) and Grade II braille.

3. Character Height: 1 inch (25 mm).

4. Sign Height: 2 inches (50 mm), unless otherwise indicated.

5. Office Doors: Identify with room numbers to be determined later, not the numbers indicated on Plans; in addition, provide "window" section for replaceable occupant name.

6. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on Plans.

7. Rest Rooms: Identify with pictograms, the names “Unisex”, room numbers to be determined later, and braille.

2.2 SIGN TYPES

A. Flat Signs: Signage media without frame.

1. Edges: Square.

2. Corners: Square.

3. Wall Mounting of One-Sided Signs: Tape adhesive.

B. Color and Font: Unless otherwise indicated:

1. Character Font: Helvetica, Arial, or other sans serif font.

2. Character Case: Upper case only.

3. Background Color: To be determined.

4. Character Color: Contrasting color.

2.3 TACTILE SIGNAGE MEDIA

A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:

1. Total Thickness: 1/16 inch (1.6 mm).

2.4 ACCESSORIES

A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs and mount at heights indicated on Plans and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until substantial completion; repair or replace damaged items.

3.3 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.4 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL

ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 101400

SECTION 102641

BALLISTICS RESISTANT PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Laminated fiberglass ballistics-resistant panels.

1.2 RELATED REQUIREMENTS

A. Section 092116 - Gypsum Board Assemblies: Metal framing to receive ballistics-resistant panels.

1.3 ABBREVIATIONS AND ACRONYMS

1.4 REFERENCE STANDARDS

A. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.6 SUBMITTALS

A. Product Data: Manufacturer's current data sheets on each product to be used.

B. Shop Drawings: Details of installation of ballistics-resistant panels, including plan views, elevations, sections, and details of the proposed installation with attachment methods.

C. Certificates: Submit printed data to indicate compliance with following requirements.

1. UL Listing verification and UL 752 Current Test Results as provided by Underwriters Laboratories.

D. Manufacturer's Instructions: Indicate preparation and installation.

E. Warranty Documentation: Manufacturer warranty; ensure that forms have been completed in DRBA's name and registered with manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name, manufacturer's identification, and required UL and NIJ certification labels until ready for installation.

B. Handle material with care to prevent damage. Stack panels flat, store inside under cover off the ground in a dry location, and protect from other construction activities.

1.8 FIELD CONDITIONS

A. Install products under environmental conditions (temperature, humidity, and ventilation) recommended by manufacturer.

1.9 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide ten-year manufacturer warranty for materials and workmanship against defects commencing on the date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Laminated Glass Fiber Ballistics-Resistant Panels:

1. Armortex: www.armortex.com/#sle

2. Insulgard Security Products: www.insulgard.com/#sle

3. Total Security Solutions: www.tssbulletproof.com/#sle.

4. Waco Composites; ArmorCore: www.armorcore.com.

5. Approved equal.

2.2 LAMINATED FIBER BALLISTICS-RESISTANT PANELS

A. General:

1. Laminated fiber ballistics-resistant panels to be non-ricochet type. When struck by a bullet or projectile, the panels to delaminate in such a way that absorbs the energy, stops the projectile, and prevents ricochet or spalling.

2. Ballistics Resistance of Joints: Equal to that of the panel.

B. Performance Requirements:

1. Ballistics Resistance Rating: Listed and labeled as tested in accordance with UL 752 Level 2 (high-power handgun) threat rating.

C. Laminated Fiber Panels:

1. Material: Multiple layers of fiberglass woven roving bonded together with resin and compressed into flat rigid sheets.

2. Panel Size: Maximum size to limit number of seams.

3. Panel Thickness: Minimum thickness required for selected UL 752 threat level.

4. Attachment Method: Mechanical fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify that substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation of this work.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install panels in accordance with manufacturer's instructions and Shop Drawings and in proper relationship with adjacent construction.

1. Maintain ballistics-resistive rating at panel junctures with concrete floor and roof slabs, bullet-resistive door and window frames, and required penetrations.

B. Reinforce panel joints with a minimum 4 inch (102 mm) wide back-up layer of ballistics-resistant material, centered on panel joints.

C. Secure panels using screws, bolts, or industrial adhesive.

3.4 PROTECTION

A. Protect installed panels from subsequent construction operations.

B. Touch-up, repair or replace damaged panels before date of substantial completion.

3.5 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.6 BASIS OF PAYMENT.

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for

work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 102641

SECTION 102800

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Commercial toilet accessories.

B. Commercial shower and bath accessories.

C. Under-lavatory pipe supply covers.

1.2 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Concealed supports for accessories, including in wall framing and plates, above ceiling framing, and framing required for flooring.

1.3 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASTM C1036 - Standard Specification for Flat Glass; 2016.

C. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2018.

1.4 SUBMITTALS

A. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

B. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

B. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

2.2 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

2.3 COMMERCIAL TOILET ACCESSORIES

A. Waste Receptacle: Recessed, stainless steel, seamless lower door for access to container, with tumbler lock, reinforced panel full height of door, push-in self-closing top door, continuously welded bottom pan and seamless exposed flanges.

1. Liner: Removable seamless stainless steel receptacle.

2. Minimum capacity: 12 gallons (45 liters).

B. Mirrors: Stainless steel framed, 1/4 inch (6 mm) thick annealed float glass; ASTM C1036.

1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.

2. Frame: 0.05 inch (1.3 mm) angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.

3. Backing: Full-mirror sized, minimum 0.03 inch (0.8 mm) galvanized steel sheet and nonabsorptive filler material.

C. Grab Bars: Stainless steel, smooth surface.

1. Standard Duty Grab Bars:

a. Push/Pull Point Load: 250 pound-force (1112 N), minimum.

b. Dimensions: 1-1/4 inch (32 mm) outside diameter, minimum 0.05 inch (1.3 mm) wall thickness, exposed flange mounting, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar.

c. Length and Configuration: As indicated on Plans.

D. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.

2.4 COMMERCIAL SHOWER AND BATH ACCESSORIES

A. Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.

2.5 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:

1. Insulate exposed drainage piping including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.

2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.

3. Construction: 1/8 inch (3.2 mm) flexible PVC.

4. Color: White.

5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.

6. Products:

    a. Plumberex Specialty Products, Inc.; Plumberex Handy-Shield Maxx: www.plumberex.com/#sle

    b. Approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

3.2 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on Plans.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.4 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.5 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13 -GENERAL

ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 102800

SECTION 123217

CONSOLE FURNITURE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for work required on Console Furniture.

B. Coordinate the work of this Section with the requirements of the Project.

1.2 SUBMITTALS

A. Product data

B. Shop Drawings

C. Installation Instructions

D. Operating and Maintenance Manual

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide console furniture by Watson Consoles.

1. Furniture Representative: Ted Servetnick, Centerpoint LLC, 15 Club Ridge Lane, Willingboro, NJ 08046, phone (856) 912-6555

2.2 REQUIRED PRODUCT CERTIFICATIONS

A. ANSI/BIFMA X5.5-2008, Desk Products

B. ANSI/BIFMA Furniture Emissions Standard M7.1 and e-3-2014e

C. UL 962

D. CSA C22.2#68

E. FCC e-CFR Title 47: Telecommunication, Part 15 – Radio Frequency Devices, Subpart B: Unintentional Radiators

F. ICES-003: Information Technology Equipment

G. SCS Global Services Indoor Air Advantage Gold SCS-EC10.3-2014 v3.0

2.3 PRODUCT REQUIREMENTS AND CONSTRUCTION

A. Public Safety/911 Emergency Communication Centers have unique challenges and demands; conventional office furniture does not provide an acceptable level of function, technology integration, user ergonomics features, nor durability. When specifying furniture for an Emergency Communications Center, it is important to recognize that furniture should meet minimum requirements to support key performance requirements:

1. Consoles are utilized 24 hours per day/ 7 days per week by different employees with different physical sizes and needs; this is more than five times the average use and wear of conventional office furniture annually.

2. Consoles must house and power extensive technology support including multiple monitors - in- line, stacked and/or combined with large-format screens models.

3. Console furniture must provide additional storage for ancillary rack mount electronics.

4. Consoles must provide no less than 10 years of 24/7 use which is required for the expected 80,000 hours of use over the course of a console's lifetime.

B. Conventional office furniture systems will not be considered for emergency communications center applications. The following categories have been identified for critical compliance and should be met by Dispatch Console furniture manufacturers and providers.

Stability – Function	Main Body Electrical Requirements	Monitor Viewing Support
Support Adjustments	Partitions and Screens	Technology Equipment Enclosures
Personal Base Storage	Personal Stacking Storage	Stacking Pallets
Cable Management Rail	Materials	General Electrical Requirements
Wire and Cable Management	Environmental Control System	Supplemental Task Lighting
Experience & References	Space Planning & Console Specifics	Comprehensive Warranty, Service & Maintenance Agreement
Lead Time & Installation Rigor	Documented Product Certifications	

C. Consoles should be designed and manufactured to meet the following industry standard, and third party tested, guidelines for safety, strength, durability, and a healthy workplace:

1. UL 962 Listed as a complete furniture assembly. Any deviation from the specification MUST be submitted in writing.

2. CSA (Canadian Standards Association) C22.2#68. Any deviation from the specification MUST be submitted in writing.

3. SCS Global Services Indoor Air Advantage Gold SCS-EC10.3-2014 v3.0 certified for protecting indoor air quality by minimizing volatile organic compound chemical off gassing through design engineering and materials selection. Any deviation from the specification MUST be submitted in writing.

4. CARB (California Air Resources Board) compliant for reduction of formaldehyde emissions, identified as an airborne toxin. Any deviation from the specification MUST be submitted in writing.

5. FCC eCFR Title 47, Part 15 Radio Frequency Devices, Subpart B: Unintentional Radiators. Any deviation from the specification MUST be submitted in writing.

6. ICES (Interface Causing Equipment Standard) -003: Informational Technology Equipment. Any deviation from the specification MUST be submitted in writing.

7. Textiles compliance with CA TB 117 (California Technical Bulletin) Flammability Standard Requirements for Upholstered Furniture products. Any deviation from the specification MUST be submitted in writing.

D. The following functional specification requirements must be met by the console provided.

1. Stability – Function

a. The console furniture is designed specifically for 24/7 operations in an emergency communications center environment.

b. The console furniture is modular in design so as to be easily reconfigured and upgraded.

c. Technology storage and personal storage units stand free from the main console body so they can be field removed or replaced without deconstruction on the console unit.

d. Sit-to-stand legs are bolted into the console undercarriage and to the underside of the input support surface creating maximum proportional stability; free-standing leg and feet systems will not be acceptable.

e. There are no obstructions side-to-side obstructions within the console footprint that will inhibit movement by the user, a critical component in order to provide on-going training of users and technology. Knee space must span a minimum of 70% of the console's overall width.

f. Horizontal work surfaces are supported by a formed steel sub-frame for maximum durability.

g. Horizontal work surfaces must be strong and rigid and able to meet all required standards for furniture construction as outlined by ANSI/BIFMA X5.5-2008, Desk Products.

2. Input support surface

   a. The input support surface must lower to at least 24.5″ from the floor.
   b. The input support surface must raise to 50″ above the floor to accommodate the 99th percentile standing male per ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.2.4.3.
   c. The height-adjustability must be engineered so as to provide infinite adjustment throughout the entire adjustment range, a critical function to meet ergonomic standards and reduce repetitive strain injuries and carpal tunnel syndrome.
   d. The input support surface must be a level platform that is wide enough to accommodate multiple input including keyboards, mice, and writing surface; the input platform surface area should be a minimum of 1300 sq. inches.
   e. The input support surface must have enough surface area to accommodate input devices within a primary and a secondary work zone and to meet ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 5.2.4.1 standards.
   f. The input support surface must allow the user to maintain elbow angles between 70 and 135 degrees to meet ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 5.2.1.1 standards.
   g. The electronic adjustment must be independent of the monitor support; other adjustment methods will be deemed unacceptable.
   h. The electronic adjustment must be controlled through a digital read-out to ensure precise user-preferred replication.
   i. The electronic adjustment controls must be mounted in a location that meets ADA standards for accessibility.
   j. Top mounted adjustment controls will be deemed not acceptable.
   k. Adjustment controls shall have an option for a Wellness function to track standing usage and encourage users to use the adjustment controls to change posture throughout their shift.
   l. The input support surface must adjust simultaneously with the monitor support in order to retain relative positioning between both surfaces when changing from sitting to standing. This promotes ergonomic alignment and a timely and controlled shift from sitting to standing work postures.
   m. The input support surface must allow adjustment of the line-of-sight viewing distance between the eyes and front surface of the viewable display area within the range of 19.7″ and 39.4″ to meet ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 5.2.4.2. The entire surface and all environmental controls shall move with the input surface to maintain preferred and ergonomic settings.

n. The input support surface must have a static load capacity of 1200 lbs. and an equipment load capacity of 500 lbs. to accommodate multiple models and quantities of various input devices.
o. Lifting columns for the input surface should be integrated into the storage cavities for increased stability; leg set bases should not be exposed.
p. The input support surface legs must have integrated anti-collision software to promote user safety, detect obstacles and prevent damage to console or equipment.
q. A minimum safety clearance of 1.25″ shall be required between all moving surfaces. ANSI-HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.1.2.
r. There shall be no entrapment zones, as defined by UL 962.
s. The input surface must have a welded steel sub-frame for increased structural integrity.
t. The position of the input support surface relative to the lifting legs and ancillary enclosures needs to be positioned so as to provide unobstructed knee clearance for users in the seated operating position and in accordance with ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.2.1.
u. The input support surface should be controlled through the use of 24 VDC motors. All powered components must be UL 962 listed and should be CSA (Canadian Standards Association) certified.
v. Must utilize a dual brake for stability and prevention of binding. Braking system must lock surface into place when the brake is released.
w. There should be surface-mounted, user-configurable, user-accessible voice and data connections (RJ12, RJ45 USB, 3.5mm Audio) available and accessible from the front of the console.
x. All moveable components of the console's input support surface and lifting mechanisms shall be designed and tested to at least 40,000 cycle full range adjustments.

3. Monitor Viewing Support

a. The console design must include adjustment of monitors so that the gaze angle to the center of the screen ranges between 15° and 20° below horizontal eye level per ANSI-HFES 100-2007 Human Factors Engineering of Computer Workstations 5.2.4.3.
b. The console design must accommodate use of up to (5) 21″ widescreen LCD flat panel monitors on a single tier, and up to (10) 21″ widescreen LCD flat panel monitors in a stacked configuration and provide independent angle adjustment for each.
c. The monitor mounting array should allow for concurrent focal depth movement of at least four monitors at once.
d. Monitor viewing support controls must be mounted in a location that meets ADA standards for accessibility; top mounted adjustment controls will be deemed unacceptable.

e. Monitor viewing support must be controlled through the use of 24 VDC motors. All powered components must be UL 962 listed and should be CSA certified.
f. Monitor viewing support must be independently adjustable.
g. All moveable components of the console's monitor viewing support system shall be designed and tested to at least 40,000 cycle full range adjustments.

4. Support Adjustments

a. All mechanical and powered support adjustment mechanisms shall operate at a speed approximately 1″ per second.
b. Input surface support adjustment mechanisms must be controlled through a digital read-out to ensure precise replication for individual users who share a single console workstation. All mechanical and powered support adjustment controls must be mounted in a location that meets ADA standards for accessibility; top mounted adjustment controls will be deemed unacceptable.
c. All mechanical and powered support adjustment mechanisms including "lifting systems" must operate quietly with a maximum sound level of 50 db.

5. Partition Screens

a. Partition and screen frame components must be constructed of 14-gauge cold rolled steel for maximum strength and durability.
b. All steel frame components must be bolted together in a minimum of four places to ensure maximum strength and durability.
c. All steel components must be powder coated for lasting durability; enamel paint is not sufficiently durable and will not be acceptable.
d. All external-facing screen components must be available in abrasion resistant fabric covering.
e. Internal screen components, including tackable core surfaces, must be fabricated with materials that contain a minimum of 85% recycled content.
f. The partitions and screens must be integrated into the main body of the furniture; freestanding panels will be deemed unacceptable.
g. The screen/partition system must sit within the console body's footprint so as to not reduce available open floorspace.
h. All screen and partition fasteners must be completely concealed.
i. All screen and partition components must be field replaceable.
j. All side and back facing screen and partitions must be available in 42″, 48″, 54″ and 60″ heights; 36″ return screens should also be available.
k. All screen and partitions must be available with a shatter-proof 12″ acrylic upper section to help maintain sight lines.

6. Equipment Enclosures - Console Technology Storage

a. Console technology storage enclosures must be accessible from both the front and the rear.
b. Console technology storage enclosures must not attach directly to the primary work surface.
c. Console technology storage enclosures must be available in 24″ and 30″ heights.
d. Console technology storage enclosures must be available in 30″, 42″ and 50″ widths.
e. Console technology storage enclosures must be available in a 24″ depth.
f. Enclosures must be engineered to support stacking storage components atop the units to allow for additional technology storage or personal storage without taking up added floor space.
g. Console technology storage enclosure rear access doors must offer cooling by a minimum of 2 each 50 CFM axial cooling fans.
h. Console technology storage enclosure front access doors must utilize a vented plenum system to draw cool air into the enclosure.
i. All console technology storage enclosure must have an active cooling system to ensure that cabinets are kept at the optimum temperature for peak technology performance.
j. Console technology storage enclosures must have horizontal cable management systems.

7. Cable Management Rail

a. There should be a horizontal cable management rail for running cabling from one side of the console to the other.
b. The wood cable management rails should be constructed of 42 lb. density particle board panel with THERMALLY FUSED MELAMINE (THERMALLY FUSED LAMINATE) on both sides.
c. All steel components within the wood cable management rail must be powder coated for durability; enamel paint is not sufficiently durable and will are considered unacceptable.
d. Internal cable management channel must be able to house a minimum of 40 each Cat-6 cables and one each 1″ flexible conduit.
e. Internal cable management channels must contain fastening points to prevent unintentional movement and disconnection of cabling during active service.
f. The wood cable management rail must have a locking option to prevent unauthorized personnel access to internal cabling.
g. The wood cable management rail must be available in both single access and dual access configurations to allow maximum flexibility and future reconfiguration.

8. Enclosures - Personal Base Storage

a. Personal base storage enclosures must be available in 24″ and 30″ heights.

b. Personal base storage enclosures must be available in 30″, 42″ and 50″ widths.
c. Personal base storage enclosures must have optional filing storage sized at 20″ wide.
d. Personal base storage enclosures must be available in a 24″ depth.
e. Personal base storage enclosures must be available in single and dual sided configurations.
f. Personal base storage enclosures must be available in combinations including open-drawer- door, open bookcase, and closed-door configurations.
g. Enclosures must be engineered to support stacking storage components atop the units to allow for additional personal storage without taking up added floor space.

9. Enclosures - Personal Stacking Storage

a. Personal stacking storage enclosures must be available in 18″, 24″ and 30″ to correspond with the heights of the partition screens.
b. Personal stacking storage enclosures must be available in 20″, 30″, 42″ and 50″ widths.
c. Personal stacking storage enclosures must be available in a 24″ depth.
d. Personal stacking storage enclosures must be available in single and dual sided configurations.
e. Personal stacking storage enclosures must be available in combinations including open- drawer-door, open bookcase, and closed-door configurations.

10. Enclosures - Stacking Pallets

a. Stacking pallet enclosures must be available in an 8″ height.
b. Stacking pallet enclosures must be available in 20″, 30″, 42″ and 50″ widths.
c. Stacking pallet enclosures must be available in a 24″ depth.
d. Stacking pallet enclosures must be cable ready to allow the placement of electrical components.
e. Stacking pallet enclosures must include at least one grommet pass through and at least one monitor support mounting location.

11. Materials

a. Storage Enclosures
    i. Wood parts should be constructed of 42 lb. density particle board with THERMALLY FUSED MELAMINE (THERMALLY FUSED LAMINATE) on both sides.
    ii. Steel parts should be manufactured from 14-gauge cold rolled steel for maximum strength and durability.

b. Surfaces

i. All monitor and input surfaces should be 42 lb. density, 3/4″ thick wood core material, pressure bonded with a high-pressure horizontal grade laminate top and sealing horizontal grade backing sheet of laminate on the underside to prevent deflection.

c. Edge Material
    i. All storage enclosures, including fixed or mobile pedestals, must have edges finished with 1.5 mm thick thermoplastic polypropylene extrusion with self-healing properties for maximum durability.
    ii. All input support surfaces must use a 3mm thick thermoplastic polypropylene extrusion edging with self-healing properties for maximum durability.
    iii. All input surface edging must have a minimum 3mm radius on front edge so as to comply with ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.1.4.

d. Laminates
    i. High pressure laminate must meet ANSI/ASME A 17.1; 1986 requirements for Class "B" laminate and ASTM D523-89, providing a non-glare matte finish.
    i. All monitor and input surfaces must be .0625″ thickness horizontal grade laminate on the top surface and on the backing sheet, to prevent deflection.
    ii. Thermally fused laminate must meet NEMA LI-1-1998; low pressure laminate is not acceptable.

e. Textiles/Fabric
    i. All textiles must be abrasion resistant to meet ASTM D-3597 MVPTS-198 standard.
    ii. All textiles must meet flammability requirements in accordance with ASTM E-84 (Tunnel Test) Class A, or 1, and the State of California Technical Bulletin 117 Sec. E (SC-191-53) standards.
    iii. All textiles must be made from 100% recyclable materials.

f. Powdercoat
    i. Powdercoat must meet ASTM D3359-09 adhesion standard for durability.
    ii. Powdercoat must meet PCI #8 Solvent Cure Test for durability.

12. Electrical Requirements

a. Each console will have (2) Power Distribution Units (PDU) that may be specified by the Engineer as 15A, 20A plug or 20A Locking. Each PDU Unit must provide (13) NEMA 5-15R outlets and a NEMA 5-15P input. PDU unit must include a 15-foot cord. PDU must be UL listed and CSA rated.

b. The total power draw for an individual console may not exceed 13.3 amps; this includes the console lifting system and all environmental controls.
c. The console should comply with UL standard 962 ensuring the highest standard of electrical and physical safety.
d. The console should be rated to comply with FCC Title 47 Part 15 subpart B/ICES-003 for Radiated and Conducted emissions.

13. Wire and Cable Management

a. The console must include two cable access drops with energy chains for vertical cable management from the input support surface to the equipment enclosures so as to comply with UL 962 standards.
b. The console must include energy chains for horizontal cable management between the moving surface and adjacent fixed surface to preserve optimal and secure operation of cords and cables during the console's active use.
c. A quick connect user-accessible interface with accommodations for up to 10 configurable ports must be available and must include ports, jacks and cables for: USB-A, RJ45, RJ11/12, and 3.5mm stereo audio connection kits; the quick connect interface must also provide cable management for the equipment it serves.
d. The console infrastructure must support cable management from the user's position to the CPUs inside the console.
e. The console must have a horizontal cable raceway for unencumbered and easily serviceable runs.
f. The console must have a horizontal cable raceway that is easily accessible and allows drop-in cable runs to accommodate easy technology updates and service access.
g. Cables routed within the walls of a furniture panel system will not be acceptable.

14. Environmental Control System

a. Control Panel
    i. The control panel for all environmental settings (task lighting, heating controls, and air distribution) must be integrated with the console body.
    ii. The control panel must be easy to clean and sanitize.
    iii. The height for the input support surface must be shown on a digital read-out to ensure total replication of console positioning for all employees; the digital readout for the input support surface shall display inches from the floor.
b. ADA Compliance
    i. There must be an optional electronic adjustment control located within reach of a wheelchair to meet ADA requirements.

c. Air Distribution
    i. Fans shall be incorporated into the furniture design, providing maximum individualized control within the user's primary work zone.
    ii. The console must have user-adjustable fans for circulating filtered air with a minimum of two distinct speeds.
d. Lighting Levels
    i. The console must integrate 12VDC LED lighting solutions.
    ii. The console must have integrated ambient lighting.
    iii. The console must have flexible gooseneck style task lighting to allow proper placement of light over work area.
    iv. All integrated lighting on the console shall be mechanically fastened to the console to prevent removal; lights should be removable for maintenance.
e. Personal Heating
    i. System shall provide one ceramic forced heating source that is rated 400 watts and located under the input support surface. Rated for 400 watts total.
    ii. Floor mounted heating solutions will not be acceptable.
f. Power Requirements
    i. The console should operate with 120 VAC, 60Hz.
    ii. The console must have a 15 ft. power cord with 3-prong plug.
    iii. The console should draw a minimum of 0.3 amperes and a maximum of 13.3 amperes.
g. On/Off Task Lighting-Freestanding Supplemental Task lighting
    i. The console should accommodate a 3-point articulating arm that swivels 120-degrees and provides a 180-degree tilt for additional light control.
    ii. The console should accommodate additional task lighting that can by mounted to the input support surface using a grommet mount, or directly to the monitor support rail.
    iii. All task lighting on the console must provide approximately 50,000 hours of lamp life.
    iv. The task lighting color temperature should not exceed 3,800K.
    v. The task lighting should have a 3-lever dimmer to adjust illumination as needed to reduce eye strain.
    vi. Ancillary task lighting must be available in three colors - silver, white, and black.

15. Experience & References

a. The manufacturer of the console furniture being proposed must have a proven record of product longevity and customer service in a 24-hour operating environment for public safety dispatch centers of similar size to this request.

b. The manufacturer of the console furniture being proposed must have a minimum of fifteen (15) years' experience in designing, manufacturing, and servicing ergonomic console furniture will be considered.
c. The manufacturer of the console furniture being proposed must provide references for similar sized projects that were installed within the last 10 years; include the agency name, location, number of positions, and contact.
d. The bidder must be the manufacturer of all major components such as work surfaces, console panels, structural support system, and environmental controls.

16. Space Planning & Console Specifics

a. Perspective drawings are required with the response submission and must include height, width, and depth dimensions in order to determine compliance with the specifications.
b. All accessories being proposed should be shown in the drawings.
c. Electronics to be provided by the DRBA such as monitors, telephones, keyboards, mice, etc. shall be shown, to scale, in the 3-dimensional/perspective drawings.

17. Warranty and Service and Maintenance Agreement

a. The bidder and manufacturer must provide at least ten (10) year warranty coverage for all console components (including electronics and buy-out parts), including delivery. For no less than the first five (5) years of the warranty coverage, absolutely no labor costs associated with replacement or repair of any portion of the product or installation will be permitted to be passed on to the DRBA.
b. The bidder and manufacturer must provide lifetime warranty on all structural components. After five (5) years, labor and installation expenses associated with the product replacement under the warranty will be assessed on a case-by-case basis. Products not covered for life include electrical components, monitor arms, and the input platform mechanisms.
c. The Contractor and manufacturer must provide an optional service and maintenance agreement that can be quoted upon request, to mitigate hidden expenses associated with product replacement after the initial warranty period. The optional service and maintenance agreement must cover additional required installation and regularly scheduled service that may occur after the initial warranty period expires.

PART 3 - EXECUTION

3.1 LEAD TIME & INSTALLATION

A. The manufacturer must provide lead times and identify date of order and proposed final installation at each location.

B. The manufacturer must include a shipping estimate for direct, inside delivery to the facility.
C. Only the manufacturer's factory installers or their trained and authorized designees experienced with the working environment of a public safety dispatch center shall assemble and install the console furniture; documentation must be provided for the installation foreman.
D. The manufacturer must provide a plan for a post-installation walkthrough intended to confirm full compliance to the floor plan, console design, and materials specified.
E. The manufacturer must provide a detailed plan for training all users and support staff in the proper use of all adjustment controls, ergonomic functions, and technical access.
F. The manufacturer must provide user manuals.

3.2 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.3 BASIS OF PAYMENT.

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 13 - GENERAL ARCHITECTURAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 13-GENERAL ARCHITECTURAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 123217

END OF DIVISION 13: GENERAL ARCHITECTURAL

DIVISION 20: GENERAL MECHANICAL/PLUMBING
SECTION/DESCRIPTION
200000 General Mechanical Requirements
210000 Fire Protection
220000 General Plumbing Requirements
230000 Heating & Air Conditioning

SECTION 200000

GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for work under General Mechanical Requirements.

B. Coordinate the work of this Section with the requirements of the Project.

1.2 DEFINITIONS

A. Following are definitions of terms and expressions used in the Mechanical Sections in addition to definitions found in the Contract Conditions:

1. “Piping” includes pipe, fittings, valves, hangers, and other accessories that comprise a system.
2. “Ductwork” includes ducts, fittings, housings, dampers, hangers, and other accessories, which comprise a system.
3. “Refurbish” shall include but not be limited to: inspecting/repairing unit cabinet, such as repairing, seals/latches, curbs, etc., cleaning coils, replacing belts, lubricating bearings, changing filters, inspecting and cleaning gas fired heat exchanger, cleaning/repairing condensate drain and secondary drain pan, check and adjust refrigeration charge on each unit, leak test and repair any refrigeration leaks, etc. to bring the piece of equipment being refurbished into the manufacturers original operating specifications/tolerances and provide warranty of operability for 60 days after the systems have been turned over to the DRBA.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements

1. Work shall conform to the requirements of the codes, laws and ordinances of Lewes, DE, the National Fire Protection Association, American Society of Mechanical Engineers and other authorities having jurisdiction.
2. Comply with applicable codes, laws, standard practices.
3. Comply with the standards of good practice as outlined in the ASHRAE Guide, the Sheet Metal and Air Conditioning Contractor's Association's “Duct Manual”, and the Apprentice Training Manual of the Steam Fitters Union.
4. The requirements of the authorities having jurisdiction shall take precedence over the Plans and Specifications and changes required by the authorities shall be made after review by the Engineer.

1.4 SUBMITTALS

A. Shop Drawings are required for the following:

1. Plumbing

    a. Plumbing Fixtures

2. Fire Protection

    a. Sprinkler Piping
    b. Equipment
    c. Hydraulic Calculations

3. Heating and Air Conditioning

    a. Air Devices
    b. Insulation
    c. Exhaust Fans
    d. Heating and Air Conditioning Equipment
    e. Mechanical/Electrical Coordination
    f. Temperature Controls
    g. Testing, Adjustment and Balancing Reports and Qualifications

B. Review of Shop Drawings does not relieve the Contractor of responsibility for complying with the contract documents.

1.5 PROTECTION

A. Protect material and equipment from damage.
B. Post notices prohibiting the use of water closets.
C. Provide plastic protection inserts, specifically manufactured for the bathtubs and shower stalls.
D. Cap or plug openings in equipment, piping and ductwork with proper caps and plugs.
E. Building materials should be stored in a weather-tight, clean area prior to unpacking for installation.
F. Accumulation of water during construction should be avoided and any porous construction materials such as insulation should be protected from moisture.

1.6 VARIANCES

A. Where conflicts exist within the contract documents, request clarification prior to the submission of a bid. If clarification is not requested, provide the work representing the higher cost and quality.

1.7 WARRANTY

A. During the warranty period, make the proper adjustments of systems, equipment and devices installed and perform work necessary to ensure the efficient and proper operation of the systems, equipment, and devices.
B. Certain items of equipment shall be warranted for a longer time than the general warranty period. Provide for service or replacement required in connection with the warranty of these items.
C. The warranty period shall not begin until the project has reached substantial completion. Any warranty limits from the manufacturer related to delivery of equipment or unit startup shall be between the Contractor and the manufacturer only and shall not impact the warranty between the DRBA and the Contractor.

PART 2 - PRODUCTS

2.1 PRODUCTS TO BE USED

A. Items are specified by designations such as trade name, manufacturer's name, catalog number and indicate the capacity and quality of the products or materials to be used on this project.
B. Only products indicated on Contract Documents by name and model number have been coordinated with other trades. Coordinate items of other manufacturer with other trades.

2.2 MATERIALS AND WORKMANSHIP

A. Items shown and not specifically called for, or items specified and not specifically indicated or detailed on the Plans, or items neither specified nor shown, but which are reasonably incidental to and commonly required to make a complete job, shall be provided.

2.3 FOUNDATIONS AND EQUIPMENT SUPPORTS

A. Provide foundations, supports, curbs and bases for equipment, as indicated or necessary for satisfactory installation and operation of equipment. Furnish and set anchor bolts.
B. Concrete pads shall be 4 inches thick minimum, thicker if necessary to accommodate a particular piece of equipment. Edges shall be beveled with outer edge extending 3 inches beyond equipment. Provide concrete pads for floor-mounted equipment. Exterior pads shall be reinforced and shall have edges turned down to below the frost line. Exterior pads shall extend eight inches beyond edges of equipment and shall be sloped for drainage.
C. Exterior equipment pads shall be 3 inches thick minimum E-Lite plastic pads manufactured by Diversitech with 3″ high riser legs and shall extend 6 inches beyond edges of equipment and shall be sloped for drainage.
D. Floor mounted stands, supports, rods or legs, where required, shall be constructed of structural steel shapes (angles, channels) of Kindorf or Unistrut or steel pipe and fittings securely braced and fastened to flanges bolted to the floor. Minimum rod size shall be 3/8-inch diameter. Paint steel with rust inhibiting paint.

2.4 ROOF SUPPORTS AND CURBS

A. Provide equipment supports and curbs for the equipment and piping installed on or through the roof. Roof curbs shall be approved for use by the National Roofing Contractors National Association and shall be a minimum of 14 inches high. Curbs shall be sloping roof type suitable for pitch of the roof and shall set the equipment level. Curbs shall be double wall insulated type.

B. Provide wood blocking to raise the level of the bottom of the curb to be level with the top of the roof insulation.

C. Pipe curb assemblies, except for plumbing vent pipes shall be constructed of 18-gauge galvanized steel with base plate, raised cant, wood nailer strip and galvanized steel counter flashing. Top shall be provided with acrylic clad ABS plastic cover and graduated neoprene boots secured to cover and pipes by stainless steel band clamps. Pipe curbs shall be Pate Company PCA-5 or equivalent of Thy Curb.

D. Equipment supports shall be constructed of 18-gauge galvanized steel with base plate, raised cant, insulation, wood nailer strip and galvanized steel counter flashing. Equipment supports shall be Pate Company ES-5b or equivalent of Thy Curb.

E. Roof mounted stands, supports, rods or legs, where required, shall be constructed of structural steel shapes (angles, channels) of Kindorf or Unistrut or steel pipe and fittings securely braced and fastened to flanges bolted to the associated equipment support. Minimum rod size shall be 3/8-inch diameter. Paint members which have been cut or have been damaged with touch up rust inhibiting paint.

2.5 HANGERS AND PIPE SUPPORTS

A. Provide pipe hangers and supports to maintain required slope and alignment for equipment and piping. Pipe hangers shall be as manufactured by Carpenter & Patterson, Fee & Mason, Modern Hanger or Grinnell.

B. Pipes may not be supported from other pipes. Trapeze hangers may be used for parallel runs of pipe with same slope.

C. Provide sway bracing at sufficient intervals to prevent lateral motion of horizontal or vertical piping and ductwork as required by the jurisdiction to meet the appropriate regional requirements.

D. For pipe and tubing, both horizontal and vertical, and regardless of the spacing of other supports, provide supports at or near changes in direction. Hangers shall be spaced at not over 6 feet apart for ½ inch pipe, not over 8 feet apart for 3/4 and 1-inch pipe and not over 10 feet for larger sizes.

E. For steel bar joist construction, hanger rods shall be supported from the top chord of the joists or from panel points of the lower chord of the joists. Where piping runs parallel to joists or where hangers are required at other than joist locations, provide steel angles welded to joists to support hangers so that weight is supported from the top chord of the joists.

F. Hangers for pipe shall be similar to Carpenter & Paterson “Clevis” figure 100. Hangers for insulated lines with vapor barrier and carrying fluids with temperatures below 70 degrees shall be large enough to permit continuous insulation. Hangers on vapor barrier insulated piping shall be provided with rigid protector saddles with rigid core of insulation to thickness of adjacent insulation. Saddles shall be 16-gauge galvanized steel and shall cover one half of the circumference of the pipe covering. Saddle shall be secured to insulation with adhesive.

G. Pipes upon or within close distance of walls shall be carried by wall brackets, Carpenter & Paterson, Fig. 221, 139, or 227 as approved.
H. Support vertical lines at floor level with extension pipe clamps. Support lowest level of riser with pipe hanger as specified above on horizontal pipe as close to riser as possible.
I. Special supports required shall be provided to suit the conditions.
J. Expansion bolts or wood plugs will not be permitted in slag block walls. Equipment hung on such walls shall be supported by through bolts or approved anchor bolts set into masonry as the wall is laid up.

2.6 OPENINGS, CHASES, LINTELS AND SLEEVES

A. Determine the location and size of chases, lintels and openings necessary for the proper installation of the work and provide them during the erection of the work in which such chases and openings occur.
B. Provide sleeves through walls and floors for pipes. Sleeves through walls shall be of sufficient size to permit the insulation, where specified, to continue through the sleeve. Sleeves through walls shall be flush with the walls.
C. In case cutting of building construction is necessary, including cutting of structural members, such cutting shall be done and repaired to match original condition of the work.
D. Where non-combustible pipes pass through sleeves or around ductwork through openings in fire rated wall, floor-ceiling and ceiling-roof assemblies, seal openings with a Underwriters Laboratories classified firestop method. Firestop method shall be a one part, intumescent (expands with heat), latex elastomer capable of expanding a minimum of three times. Firestop materials shall be UL listed when tested in accordance with ASTM E814 for a two-hour fire (F) and temperature (T) rating.
E. If combustible piping materials are used, a UL listed firestop method shall be provided where the combustible materials penetrate fire rated wall, floor-ceiling and ceiling-roof assemblies. Firestop method shall be classified by UL as a through-penetration firestop device when tested in accordance with ASTM E814 for a two-hour fire (F) and temperature (T) rating. Plastic piping materials, including, but not limited to PVC, CPVC and ABS, are combustible. Firestop method shall be similar to Nelson Firestop Products.
F. Escutcheon plates shall be used to conceal sleeve opening on exposed uninsulated piping. Floor plates shall be split chrome plated cast brass similar to Ritter No. 36A.

2.7 VIBRATION ISOLATION

A. Provide vibration isolators manufactured by a firm specializing in this type of work for equipment and piping that is capable of transmitting noise and vibration to the building structures.
B. Isolators shall be designed to suit vibration frequency to be absorbed. Provide isolator units of area distribution to obtain proper resiliency under machinery load and impact. Where unequal distribution of weight occurs, design isolators for uniform deflection under imposed load.

C. Examine the Plans for sizes, horsepowers, rotational speeds, equipment location, length of span between columns and beams and construction type to determine the isolator selection type and deflection required for each piece of mechanical equipment. Conform to the requirements of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Handbook, "HVAC Applications", Chapter 48, "Sound and Vibration Control"

D. Isolators of the same type shall be the product of the same manufacturer, Mason, Vibration Eliminator or Korfund.

E. Mountings shall be of the types indicated below:

1. Type A: Double deflection neoprene mountings shall have a minimum static deflection of 0.50″. Metal surfaces shall be neoprene covered to avoid corrosion and have friction pads both top and bottom, so they need not be bolted to the floor. Bolt holes shall be provided for those areas where bolting is required. On equipment such as small vent sets and close coupled pumps, steel rails shall be used above the mountings to compensate for the overhang. Mountings shall be type ND or rails type DNR as manufactured by Mason Industries, Inc. Color code to indicate durometer.

2. Type B: Spring type isolation shall be free standing and laterally stable without any housing and complete with ¼″ neoprene acoustical friction pads between the baseplate and the support. Mountings shall have leveling bolts that must be rigidly bolted to the equipment. Spring diameters shall be no less than 0.8 of compressed height of the spring at rated load. Springs shall have a minim additional travel to solid equal to 50% of the rated deflection. Submittals shall include spring diameters, deflections, compressed spring height and solid spring height. Mountings shall be type SLF manufactured by Mason Industries, Inc.

3. Type C: Equipment with operating weight different from the installed weight and equipment exposed to the wind such as cooling towers shall be mounted on spring mountings as described in Type B, but a housing shall be used that included vertical limit stops to prevent spring extension when weight is removed. The housing shall serve as blocking during erection and cooling tower mounts shall be located between the supporting steel and roof or the grillage and dunnage as shown on the Plans. The installed and operating heights shall be the same. A minimum clearance of ½″ shall be maintained around restraining bolts and between the housing and the spring so as not to interfere with the spring action. Limit stops shall be out of contact furring normal operations. Mounting used out of the doors shall be hot dipped galvanized. Mountings shall be SLR as manufactured by Mason Industries, Inc.

4. Type D: Neoprene cross-ribbed or waffle pattern, 5/16 inches thick. Provide ¼ inch hot dipped galvanized steel bearing plates. Permanently identify durometer. Mason Industries, Inc. Type W.

F. Provide vibration isolation as required above and as indicted in the following schedule:

EQUIPMENT	LOCATION	ISOLATION TYPE	DEFL. (IN)
Roof Mounted Condensing/Heat Pump Units		C	1.0″

2.8 ACCESS PANELS

A. In general, valves, dampers, traps and equipment shall be accessible through the removable panels in the ceiling. Where ceilings are not removable and in walls where access is required for service, access panels shall be provided. Access panels shall be appropriate for the finish in which they are installed, with a fire rating to match the wall or ceiling in which they are installed.
B. Group valves, dampers and equipment together to keep the required number of access panels to a minimum.

2.9 ELECTRICAL WORK

A. Motors and heating elements for equipment specified under the mechanical Sections of the Specifications shall be provided with the equipment.
B. Starters, disconnect switches, and work pertaining to equipment power connections are specified under Division 26 unless specified with the equipment of this Section of the Specifications. Electrical devices provided under this Division shall meet requirements for similar equipment specified under Division 26.
C. Interlock wiring, and the provision of pilot devices such as push buttons, thermostats, flow switches and similar items and their related wiring associated with the Automatic Control System, shall be provided in accordance with the applicable requirements of Division 26. For ease of servicing, permanently identify both ends of conductors with W. H. Brady Co. self-sticking Perma-Code wire markers. Mark control diagrams accordingly.
D. Coordinate control device voltages.
E. Unless specifically noted otherwise, motors ½ HP and over shall be wound for 208 volts, 1 phase, 60 hertz current, and those under ½ HP for 120 volts, single phase, 60 hertz current. Motors shall be equipped with grease packed ball bearings. Motors shall be rated for continuous duty at 100 percent of rated capacity with an ambient temperature of 40 degrees C.
F. Design motors in accordance with NEMA standards and affix to each a nameplate accurately listing pertinent data. Motors shall have sufficient capacity to start and operate the machine they drive without exceeding the motor nameplate rating at the speed specified or at speeds or loads, which may be obtained, by the drive furnished. The motor HP or KW ratings are those estimated to be required by the driven equipment when operating at specified duties and efficiencies and are used to determine electrical feeder sizes. If the actual horsepower or KW required for the equipment to be furnished is greater than the indicated horsepower or KW, it shall be provided. Changes required

in starter, feeder, branch circuit or other electrical items shall be made. Provide a Shop Drawing showing the mechanical/electrical coordination between trades. The Shop Drawing shall list all mechanical equipment with power demand, associated branch circuit feeder designation, conduit and wire size, breaker size and fused safety switch.

G. Unless otherwise indicated, polyphase motors shall be Class B, general purpose, squirrel cage, single speed, open induction type, stamped with NEMA Class B letter designation.

H. Single phase motors except as noted shall be open, capacitor start type. Motors 1/6 horsepower and under shall be permanent split capacitor type with built-in reset thermal overload protection, unless specifically noted otherwise. Motors 1/12 horsepower and smaller that start with no load may be shaded pole with built-in reset thermal overload protection.

I. Mechanical equipment with a factory wired control panel shall be wired in accordance with the National Electrical Code. Additionally, components within the panel shall bear the UL label.

J. Equipment shall be UL listed as a system or be tested by an independent electrical testing agency acceptable to the Engineer to comply with requirements of the Authority having jurisdiction.

K. Do not install equipment, ductwork or piping in the dedicated spaces above switchgear, panels and transformers as identified in the National Electrical Code.

2.10 FLASHING

A. Sanitary vent pipes passing through the roof shall be provided with conical neoprene boots for any pitch roof with base extending minimum of eight inches from vertical portion of boot. Provide clamp for securing boot to pipe.

B. Flashing assemblies specified above shall be set in place as part of the work under this Division of this Specification but will be finally installed as specified in another Division of this Specification.

C. Base flashing of roof drains, ducts, fans and other equipment, if required, is specified in Division 7 of this Specification. Cap flashings shall be provided to make a watertight seal.

2.11 IDENTIFICATION

A. Equipment shall be identified with engraved plastic laminate or anodized aluminum nameplates with pressure sensitive backing. Plates shall also be provided with drilled holes and fastened to equipment with moly-rivets. Letters shall be at least 3/8 inch high and larger in proportion to the size of the piece of equipment. Identification shall be the same as noted on schedules on the Plans. Labels shall be provided for the following equipment.

1. Air Handling Units
2. Outdoor Heat Pump Units
3. Exhaust Fans

B. Labels shall identify the piping system. Labels shall be located where pipes enter and leaves a space and at 30-foot centers on normal runs. Duct systems shall be similarly identified by noting the system and direction of flow.
C. On valves, except immediately adjacent to equipment, provide 1 inch diameter brass tag with embossed and painted black numbers to identify the valve. Tag numbers shall be coordinated between trades. Tags shall be attached to valve wheels with a brass link. Tags shall be manufactured by Brady, Seton Nameplate, or Wilmington Plastics.
D. Prepare a list showing the number and location of valves and a schematic piping diagram showing the location of numbered valves. The list and diagram shall be cross indexed so that the location and purpose of valves is identified. List and diagram shall be stored in a clear plastic envelope mounted on a wall were directed by the Engineer.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

A. Visit the site and become familiar with existing conditions. Modifications to work required to allow for existing conditions shall be provided. Submit proposed modifications to the Engineer for approval prior to installation.
B. Relocate existing hangers and supports where necessary to install new work. Maximum spacing requirements shall apply for relocated supports.
C. Coordinate interruptions in service of existing systems with the Owner. Provide temporary connections to maintain operation of existing systems.

3.2 MANNER OF INSTALLATION

A. Piping and ductwork shall be installed to preserve access to valves, dampers, and equipment. Valves, dampers, and equipment which require frequent service, adjustment, or control and which cannot be located in a readily accessible and safe place, shall be provided with extension devices and remote operators, as necessary and as accepted for use by the Engineer.
B. Piping and ductwork shall be run to follow the lines of the building and to allow the maximum headroom consistent with proper pitch. Piping subject to thermal expansion shall be arranged to permit movement without damage to the piping, ductwork, and equipment.
C. The Plans are generally indicative of the work to be installed, but they do not show all offsets, fittings and similar details required, which shall be provided to meet the job conditions. In areas where work is installed in close proximity to work of other trades or within trades covered by this Section of the Specifications, prepare larger scale drawings consisting of plans and sections to show how work is to be installed in relation to work of other trades.
D. Equipment and systems shall be installed in accordance with the requirements and recommendations of the associated manufacturer.

3.3 EXCAVATION AND BACKFILL

A. Provide excavation and backfill necessary to install underground piping and other work included in this Section of the Specifications. Establish lines and grades required for the proper location of the work.
B. After the piping has been placed, the trenches shall be backfilled to the lines of present grades or finished grade as required. No backfill shall be placed, however, until water has been removed from the trenches and joints have been set and also after the tests have been made on piping as required.

3.4 RECORD DRAWINGS

A. Keep at the site two (2) sets of black and white prints for the express purpose of showing changes from the Plans made during construction. Mark up the prints with red pencil during construction and deliver the prints, before final inspection, to the Engineer as a final set of "Record Drawings". Refer to the General Provisions of the DRBA Standard Specifications for additional requirements.

3.5 TESTING

A. Before concealing piping and before insulating piping, test piping per the requirements listed below or as required by the authority having jurisdiction, whichever is more stringent, and prove tight.
B. Replace and retest to Engineer's satisfaction pipe or fittings broken or damaged under test.
C. Before testing piping systems, remove or otherwise protect from damage, control devices, air vents, plumbing fixtures and other parts which are not designed to stand pressures used in testing piping.
D. New sanitary and storm drain piping shall be tested by a standing water test so that the highest point of the system has no less than a 10-foot head of water. Fixtures shall be removed from system and piping capped or plugged. No drop in water level shall be allowed. Test systems for a period of four (4) hours.
E. New domestic water system and new hydronic systems shall be tested hydrostatically, pumping the system to 150 psi test pressure, and holding the system at the test pressure for two hours without additional pumping. The fire protection system shall be similarly tested at 175 psi test pressure. While under pressure, visually inspect joints, welds, or other connections to determine leakage. If leaks are detected, repair leak and retest.

3.6 CLEANING OF SYSTEMS

A. After satisfactory completion of pressure tests and before permanently connecting fixtures, equipment, strainers and other accessory items, clean systems. Remove burrs, cuttings, and waste. Blow and flush piping until interiors are free of foreign matter. Take precautions to minimize scale build up. Contractor will be responsible for having a clean and scale free system at the time of substantial completion.
B. Clean strainers and dirt pockets as often as required to guarantee no system stoppage by end of warranty period.
C. The heating water piping system including boiler shall be cleaned by filling the system with water with pumps in operation and boiler water set at 180 degrees F or higher with valves open and adding a sufficient quantity of tri-sodium phosphate to provide a

solution of three (3) pounds of tri-sodium phosphate per 100 gallons of water. Strainer baskets shall be maintained during this period to prevent clogging. At the end of the 48-hour cleaning period, the system shall be drained and flushed and then refilled for operation. The system shall again be brought up to operating temperature for 48 hours and the system shall be vented with the pumps running. At this time, temporary strainer baskets shall be removed, cleaned, and reinstalled. Strainers shall be of sufficient fine mesh to protect the close tolerance of the pump, approximately 16 mesh. After one operating season, the temporary strainer baskets shall be removed, and new baskets installed in the strainers.

D. Dust shall be removed from ductwork before substantial completion. Filter media shall be new at substantial completion.

E. If systems become stopped with refuse, remove the obstruction, and replace and repair work disturbed.

F. Clean plumbing fixtures using non-scratching cleaners. Polish chromium plated work. Stilson type wrenches shall not be used on chrome plated work.

G. Dust in the construction area shall be suppressed with wetting agents or sweeping compounds. Dust shall be cleaned regularly.

H. Remove rust and clean surfaces to be insulated or painted.

I. Leave systems in clean condition and running order.

3.7 STERILIZATION

A. The domestic water piping systems shall be sterilized with a chlorine water solution so that the piping system contains water with a chlorine concentration of 100 ppm at the end of a three-hour retention period. Systems shall be flushed before sterilization. After the chlorine water solution has remained in the piping system for the specified period and at the specified concentration, the system shall be drained, flushed with clear water until the chlorine concentration is less than 1.0 ppm. Obtain representative samples of the systems water for analysis by a recognized bacteriological laboratory. If samples are not acceptable, the process shall be repeated until the samples are acceptable.

B. The domestic water piping system may be sterilized by other methods approved by local plumbing codes or the Health Department.

C. As a condition of acceptance of the system, furnish a certificate under seal to certify that the system has been sterilized to meet the requirements of the Health Department and that the system is satisfactory for human consumption.

D. Chemicals and materials used for sterilization of the systems shall meet the requirements of the authority having jurisdiction.

3.8 PAINTING

A. Remove rust, scale, grease, and dirt from equipment and material and leave ready for finish painting. Equipment specified with factory baked enamel finish shall be touched up as required to provide a surface visually free of scratches, nicks and blemishes.

B. Paint uninsulated ferrous piping, hangers and miscellaneous iron work in concealed spaces with one coat of Rust-O-Leum dampproof red primer.

C. Where metal duct is visible through a register or grille, paint the interior of the duct with flat black paint.

3.9 OPERATING AND MAINTENANCE MANUAL

A. Submit operating and maintenance instructions. The manual shall include the following:
   1. A brief description of systems and their various components.
   2. Full, definite and explicit instructions for starting, stopping, controlling and changing over systems from one season to another.
   3. List of manufacturer's representatives with address and telephone numbers.
   4. Manufacturer's printed operating and maintenance instructions, parts lists, illustrations and diagrams for pieces of equipment.
   5. A complete schedule of periodic servicing and lubrication requirements for equipment.
   6. One copy of each Shop Drawing and Contractor's drawings.
   7. One copy of other items of equipment where not required as a Shop Drawing submittal.
   8. One copy of each wiring diagram.
   9. Motor manufacturer's certificate for motors exposed to the weather.
   10. The field test data specified in Section 230000 under Balancing and Adjusting.
   11. Sterilization certificate for domestic water systems.

3.10 FIELD INSTRUCTION

A. Upon completion of work, furnish services of a competent representative to instruct Owner's representative in the proper operation and maintenance of elements of the mechanical systems. Submit instructor's name and credentials to the Engineer for approval.

B. Spend not less than 4 hours in such formal instruction to prepare DRBA to operate and maintain the systems.

C. At least 2 hours of the specified 4 hours of instruction shall occur after thirty days operation by DRBA's representative and may be divided into periods of 2 hours at different seasons of the year.

3.11 PERFORMANCE TEST

A. Should the performance or capacity of the systems, equipment or devices furnished be questioned by written notice from the Engineer after installation, provide necessary test equipment and complete a satisfactory test of the items in question. The test shall be run when and as directed by the Engineer and in the presence of his representative. Should the items furnished not pass such a test, they shall be removed and replaced by systems, equipment, or devices satisfactory to the Engineer.

3.12 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.13 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 20 - GENERAL MECHANICAL/PLUMBING. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 20 - GENERAL MECHANICAL/PLUMBING will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 200000

SECTION 210000

FIRE PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. The requirements of Section 200000 apply to work performed under this Section.
B. Section includes fire protection sprinkler systems.

1.2 QUALITY ASSURANCE

A. Regulatory requirements of the fire protection system shall be in compliance with the rules and regulations of the Fire Department and the State Fire Marshal (or his legislated authoritative representative) and in accordance with the following:
    1. Building Code
    2. NFPA 101 - Life Safety Code
    3. NFPA Standards
        a. NFPA 13
        b. NFPA 20
B. Fire alarm system and associated wiring are being performed by others. Contractor to coordinate with the Engineer any changes to the fire alarm system that may be necessary due to changes in the sprinkler system layout from that shown on the Contract Documents.

1.3 SUBMITTALS

A. A sprinkler system working drawing as required by NFPA and local jurisdiction shall be submitted to the Engineer for review after governmental and regulatory agency approvals have been obtained. The submittal shall include manufacturer's data sheets and hydraulic calculations. Approval agencies shall include the local fire department and the State Fire Marshal's office. No installation of the system shall be made until approval is obtained. System shown on the Plans is schematic and is intended for use as a guide.

PART 2 - PRODUCTS

2.1 VALVES

A. Valves on fire protection system shall be Factory Mutual stamped or UL listed.
B. Valves at base of risers and sprinkler system service shall be Stockham G634 or similar of Acme, Fairbanks, Walworth or Jenkins, 175-pound iron body, solid wedge disc with rising stem O.S. & Y. Provide a valve tamper switch for each valve. Tamper switch shall be Edwards type OSYS-U, Simplex or Pyron.

2.2 SPRINKLER SYSTEM EQUIPMENT

A. Ceiling sprinkler heads shall be chrome plated pendant heads for installation on a suspended ceiling system. Ceiling heads shall have full 360-degree spray pattern provided with fusible links or with thermal glass bulb for ordinary temperature rating. Sprinkler and other major devices shall be as manufactured by Reliable or Viking, Automatic Sprinkler.
B. Sidewall sprinkler heads shall be chrome plated, horizontal type with a special deflector to distribute the water in a uniform pattern. Sidewall heads shall have a fusible link or with thermal glass bulb or with thermal glass bulb with an ordinary temperature rating.
C. Exposed piping upright sprinkler heads shall be natural bronze finish for exposed piping installation. Heads shall have full 360-degree spray pattern provided with fusible links for ordinary temperature rating.
D. Alarm check valve shall be provided at service entrance and shall have alarm connection to the fire alarm system. Wiring from the alarm connection to the fire alarm system is to be coordinated with Authority staff.
E. Flow switches shall be Simplex, Pyrotronics, Johnson or Honeywell pneumatically damped switch with 15 second delay, actuated by a flow rate of 10 gpm or greater. Alarm shall actuate an electric switch. Wiring from the switch to the fire alarm system is specified in the Sections under Division 26.
F. Dry pendent heads shall be recessed type and shall have a full 360-degree spray pattern provided with fusible links for ordinary temperature rating. Sprinkler and other major devices shall be as manufactured by Reliable, Grinnell, Viking, Automatic Sprinkler or Hodgman.

PART 3 - EXECUTION

3.1 PIPING

A. Piping within the building shall be per NFPA 13 except that plastic pipe shall not be used.

3.2 SPRINKLER SYSTEM

A. Sprinkler system shall be a complete automatic wet pipe system complete with piping, sprinkler heads, valves, accessories, hangers, etc. System shall be generally classified for the code application hazard.
B. Layout of sprinkler heads and piping shall be coordinated with the Architectural, Structural, Mechanical and Electrical Drawings and field conditions. Provide offsets, sleeves, etc., required for the installation.
C. System shall be hydraulically designed. Computer readout sheets shall be submitted as required for approval and permit purposes.
D. Have a flow test performed in accordance with the procedures established in NFPA 20. Results of this flow test shall be included with the computer calculations.

3.3 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.4 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 20 - GENERAL MECHANICAL/PLUMBING. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 20 - GENERAL MECHANICAL/PLUMBING will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 210000

SECTION 220000

GENERAL PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 NOTE

A. The requirements of Section 200000 apply to work performed under this Section.

1.2 SCOPE

A. The work under this Section of the Specification shall include the furnishing of labor, materials and equipment for the installation of complete plumbing systems, including interior sanitary soil, waste and vent piping; storm, interior domestic hot and cold-water piping, plumbing fixtures and appliances to provide continuous and satisfactory service.

1.3 CONNECTIONS TO EQUIPMENT

A. Provide labor and materials to connect equipment furnished under this Section of the Specification.
B. Provide labor and materials to connect equipment furnished under other Sections of the Specification and requiring plumbing connections as if the equipment was furnished under this Section of the Specification. Provide traps, water stop valves, etc., for equipment requiring such connections to provide functioning systems.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Cleanouts shall be provided at ends of runs, at changes of direction and near the base of each vertical soil, waste, or drainpipe. Cleanouts shall be placed on horizontal lines every 50 feet unless the conditions require them at closer intervals. Cleanouts at the base of vertical pipes shall be placed in a fitting just above the floor. Cleanouts shall consist of Y branches or 1/4 bends the full size of the line for piping 4 inches and smaller, and 4 inches for larger pipes. Cleanouts in horizontal lines shall be extended to floor level or grade as necessary. Cleanouts shall be series as listed below:

1. Below concrete floors with no finish or ceramic tile finish.
    a. Zurn - ZN-1400-3
    b. R. Smith
    c. Watts
    d. Josam
    e. Mifab
2. Below carpeted floors (flush with concrete with identification screw through carpet).
    a. Zurn - ZN-1400-15

b. R. Smith
c. Watts
d. Josam
e. Mifab

3.Below resilient tile floors.
a. Zurn - ZN-1400-7
b. R. Smith
c. Watts
d. Josam
e. Mifab

4.Exposed horizontal piping.
a. Zurn - Z-1440A
b. R. Smith
c. Watts
d. Josam
e. Mifab

5.Concealed in finished wall-prime coat.
a. Zurn - Z-1440-1
b. R. Smith
c. Watts
d. Josam
e. Mifab

6.Base of exposed vertical pipes.
a. Zurn - Z-1445
b. R. Smith
c. Watts
d. Josam
e. Mifab

7.Base of concealed vertical pipes.
a. Zurn - Z-1445-1
b. R. Smith
c. Watts
d. Josam
e. Mifab

B. Cleanouts shall consist of cast iron ferrules and shall seat against a lead seal. Access covers shall be polished nickel bronze in finished areas, brass below carpeting. Access covers will be secured by non-ferrous tamperproof screws.

2.2 PLUMBING FIXTURES

A. Provide plumbing fixtures as shown on the Plans or as described herein. Exposed metal parts of fixtures, including faucets, waste fittings, waste plugs, strainers, flush valves, traps, supply and waste pipes and escutcheons shall be brass, chromium plated.
B. Mounting Heights of Fixtures
1. To provide for the physically disabled, plumbing fixtures shall be provided for their use at a mounting height suitable for the disabled as set forth by the Federal

Government. Fixtures for special uses need not meet this requirement. Fixture mounting heights are generally indicated on the Plans.

2. Hot water and drain piping accessible to a wheelchair patient shall be suitably protected against high temperature by molded vinyl piping covers with access to shut-off valves, trap cleanout, etc. Insulation shall have out of sight fastening system, tie bands are not approved. Covers shall be Truebro Lav Guard 2 E-Z.

C. Hot and cold-water connections to fixtures shall be provided with a stop valve. Stop valves, risers, etc. shall be commercial/institutional grade as manufactured by Brass Craft, Chicago, Engineered Systems or McGuire.

D. Provide metal supports necessary to adequately and substantially hang and set fixtures. Supports shall be Zurn, Josam or J. R. Smith and suitable for the wall thickness and piping arrangements shown.

E. Plumbing fixtures shall be caulked at wall and floor with silicone caulking material of same color as the fixture.

F. For sinks and fixtures specified under other sections and not provided with faucets, tailpieces, traps, and stop valves; provide necessary fittings and completely connect the sinks and fixtures.

G. Fixtures shall be as follows:

1. WC-1 Water Closet - elongated syphon jet action bowl with close coupled gravity flow tank, white vitreous china bowl with 17″ rim and floor outlet for 12″ rough-in to operate on 1.6-gallon flush fitted with bolt caps, screwdriver stop valve, supply pipe and flexible riser.

    a. Model
        i. American Standard – Cadet Pro – 215AA.004
        ii. Eljer
        iii. Kohler
        iv. Crane
    b. Seat - white solid plastic open front seat without cover.
        i. Church - 295C
        ii. Olsonite
        iii. Beneke

2.3 SHOCK ABSORBERS

A. Provide shock absorbers in the water piping in horizontal runs where shown on Plans and elsewhere as required to prevent noise or injury to the piping system resulting from water hammer.

B. Shock absorbers shall be J. R. Smith Hydrotrol or Zurn Z-1700 Shocktrol. Unit shall consist of stainless-steel casing and air charged bellows. Shock absorbers shall be sized as recommended in the Plumbing Drainage Institute Standard WH-201.

2.4 VALVES

A. Provide valves as indicated on Plans, as specified below and as required. Valves, where possible, shall be of one manufacturer, Stockham, Nibco or Jenkins, Jomar whose figure numbers are used below.

B. Valves 2 inches and smaller, which will be operated frequently, or will be used for throttling services, shall be ball or globe valves. Stop valves shall be ball valves.
C. Valves in the domestic hot water, cold water and hot water recirculating system shall be:

	FOR STEEL PIPE		
Description	Nibco	Jenkins	Stockham
Gate-4″ and larger IBBT, OS & Y, flanged	F-617-0	651A	G-623
Gate-3″ and smaller BBT, rising threaded stem	T-111	47	B-100
Globe–4″ and larger IBBT OS&Y, flanged	F-718-B	613	G-512
Globe-3″ and smaller BBT, threaded	T-211-Y		B-13-T
Check Valves 4″ and larger IBBT, swing, flanged	F-918-B	624	G-931
Check Valves 3″ and smaller BBT, swing, threaded	T-413-Y	92A	B-319

	For Copper Tube		
Description	Nibco	Jenkins	Stockham
Gate-2-1/2″ and smaller, bronze rising stem, solder end.	S-111	1242	B-108

Globe–2-1/2″ and smaller, bronze solder end	S-211-Y		B-14-T
Check Valves 2-1/2″and smaller, bronze, swing solder end	S-413-Y	1222	B-309

D. Ball valves may be used for shutoff and balancing purposes except on gas piping where they shall not be used except as indicated below. Ball valves shall be NIBCO figure S-580-M, Jomar T-100 or Apollo. Provide memory stop on balancing valves. Ball valves may be used for shut off purposes in gas piping 1 inch and smaller. Ball valves in gas piping shall be NIBCO GB10/GB1A

PART 3 - EXECUTION

3.1 SANITARY PIPING

A. Sanitary piping shall be extended from fixtures, appliances, etc., to the existing sanitary sewer. Verify location, size, and elevation of the existing line before performing work and notify the Engineer if discrepancies are noted.
B. Sanitary piping below the lowest finished floor to their connections to existing utilities shall be service weight cast iron pipe, ASTM A 74-15, modified and made up with neoprene double seal gaskets of the same manufacturer as the pipe. Pipe and fittings shall bear the mark of the Cast Iron Soil Pipe Institute.
C. Sanitary piping within the building, above ground shall be service weight cast iron “no hub” pipe with neoprene and stainless-steel connectors.
D. Drain piping from air conditioning unit condensate pans above the ground shall be type “L” hard drawn copper water tube, ASTM B88 with solder type wrought copper fittings, ANSI A40.3.
E. Where lines pass under or through footings, encase them in concrete to uniform thickness as approved by the engineer.
F. In connection with underground piping, connections and turns, unless otherwise specified, shall be made with Y fittings and 1/8 bends.

3.2 WATER PIPING

A. Water piping inside the building shall be type “L” hard drawn copper water tube, ASTM B88 with solder type wrought copper fittings, ANSI A40.3. Brass solder joint valves shall be used with copper tubing. Solder shall be 95-5 tin antimony type. Protect piping from materials which may cause corrosion of copper.
B. Exposed piping at fixtures shall be IPS red brass, chromium plated.
C. Mains, branches, and connections of the hot and cold-water distribution piping systems shall be provided with valves placed at the points shown on Plans or directed by the Engineer for proper isolation and control of the system. Equipment or appliances shall be separately valved so that service can be shut off and the piece of equipment or

appliance removed without disturbing the piping system. Valves shall be located so as to be accessible to the operator. Separate valves for equipment and appliances are in addition to faucets supplied herein or in other Sections.

D. Provide for expansion of piping subject to temperature changes. This shall be accomplished by swings, bends, or loops.

3.3 INSULATION

A. After the systems have been installed and tested, insulation as specified below shall be applied. Materials shall be UL, Inc., approved and shall be applied as recommended by the manufacturer's written instructions. Materials used shall be the products of Owens Corning, PPG, Manville, Knauff Corporation, Certainteed, Armstrong, Eagle Picher, Insul Coustic or Benjamin Foster and shall be equal to those products that meet the Specifications below.

B. Insulate new cold-water piping except chrome plated piping exposed at plumbing fixtures and insulate condensate drain lines. Insulation shall be heavy density long strand fiberglass, sectional insulation with all service vapor barrier jacket and double side adhesive self-sealing lap, Johns Manville Micro-Lok system or equal of Owens Corning. Insulation shall comply with ASTM E84 with a flame spread rating of 25 or less and smoke developed rating of 50 or less. Insulation thickness shall be in accordance with the Energy Code but shall not be less than ½ inch. Fittings, valve bodies, etc., shall be covered with Zeston type precut vinyl insulation jackets with pre-shaped fiberglass insert.

C. On exposed insulated piping in finished areas within seven feet of the floors, provide .010-inch-thick galvanized steel insulation jackets. This does not include piping exposed in unfinished areas such as boiler rooms, storage rooms, etc.

D. At pipe hangers, for piping carrying fluids with temperatures below 70 degrees, provide a rigid core of insulation to support the pipe. Rigid insulation shall be the same thickness as the adjacent semi-rigid insulation and have the same flame spread and smoke developed ratings. Vapor barrier shall be continuous and integral between the rigid and semi-rigid sections of insulation. Rigid insulation shall be composed of hydrous calcium silicate. Rigid insulation shall be Johns Manville Thermo-12 Gold or equal of Owens Corning.

3.4 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.5 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 20 - GENERAL MECHANICAL/PLUMBING. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 20 - GENERAL MECHANICAL/PLUMBING will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 220000

SECTION 230000

HEATING & AIR CONDITIONING

PART 1 - GENERAL

1.1 NOTE

A. The requirements of Section 200000 apply to work performed under this Section.

1.2 SCOPE

A. The Work under this Section of the Specification shall include the furnishing of labor, equipment and materials for the installation of heating, air conditioning and ventilating systems as specified, shown on the Plans or implied to provide continuous and satisfactory service.

PART 2 - PRODUCTS

2.1 AIR CONDITIONER DUCTLESS SPLIT SYSTEM – HIGH WALL

A. Provide direct expansion, split system air conditioning system consisting of exterior unit and interior fan coil unit. Unit shall be ARI rated but shall operate at the conditions and capacities as noted on the Plans.

B. Outdoor condensing unit
   1. Outdoor condensing unit shall be air cooled with horizontal air discharge provided with a hermetic compressor.
   2. Compressor shall be rotary type provided with internal vibration isolation and motor winding over temperature and overcurrent safety devices.
   3. Heater transfer coil shall be copper tube with aluminum plate fins. Heat rejection fan shall be deep pitched corrosion resistant propeller fan protected by a fan guard. Fan shall be direct driven by permanently lubricated motor with inherent overload protection and class B insulation.
   4. Provide outdoor unit with defrost controls, high- and low-pressure safety controls, time delay relay to prevent short cycling and automatic restart on resumption of electric service after a power failure. Controls shall be solid state.
   5. Casing shall be suitable for exterior use and shall be provided with baked enamel finish over properly treated galvanized steel or other approved corrosion resistant finish.

C. Indoor Unit
   1. Provide wall mounted, fan coil unit with vertical discharge compatible for use with condensing unit specified above.
   2. Fan coil unit shall be complete with insulated casing with drain pan, built-in condensate pump, copper tube aluminum fin direct expansion refrigeration coil with suitable expansion valve, distributor and solenoid valve, fan section and filter section and auxiliary electric heat. Evaporator fan shall be direct drive suitable for the installed field conditions and capacity. Provide backwater valve in condensate drain line.

D. Ductless split air-condensing unit shall be Mitsubishi, Carrier, or Sanyo.

2.2 EXHAUST FANS - CENTRIFUGAL ROOF MOUNTED UPBLAST – DIRECT DRIVE

A. Provide roof exhaust fans in accordance with the schedule on the Plans and the specifications below.
B. Housing to be constructed of heavy gauge aluminum including exterior housing, curb cap, windband, and motor compartment housing. Galvanized material is not acceptable. Housing shall have rigid internal support structure. Windband to be one piece spun aluminum construction and maintain original material thickness throughout the housing and include an integral rolled bead for strength. Curb cap base to be fully welded to windband to ensure leak proof construction. Tack welding, bolting, and caulking are not acceptable. Curb cap to have integral deep spun inlet venture and pre-punched mounting holes to ensure correct attachment to curb. Drive frame assemblies shall be constructed of heavy gauge steel mounted on double studded true vibration isolators sized to match the weight of each fan to ensure no metal-to-metal contact. Breather tube shall be 10 square inches in size for fresh air motor cooling and designed to allow wiring to run through it. Provide a drain trough to allow for one-point drainage of water, grease, and other residues.
C. Fan wheel to be constructed of aluminum and to be non-overloading, backward inclined type that has been statically and dynamically balanced. The wheel cone and fan inlet shall be matched to provide maximum operating efficiency.
D. Motor enclosure to be open drip-proof type. Motor to be a DC electronic communication type motor (ECM) specifically designed for fan applications. AC induction type motors are not acceptable. Motor to be permanently lubricated heavy duty ball bearing type to match with the fan load and pre-wired to the scheduled voltage and phase. Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor. Motor shall be speed controllable down to 20% of full speed. Speed shall be controlled by either a potentiometer dial mounted at the motor or by a 0-10 VCD signal. Motor shall be a minimum of 85% efficient at all speeds.
E. Disconnect means for single phase motors shall consist of motor starting switch inside of fan housing. Single phase motors smaller than 1/12 horsepower should provide inherent thermal overload protection and be provide with cord-and-plug for disconnect means. Three-phase motors shall be provided with three-pole disconnect switches, resilient mounted in the fan housing.
F. Roof curb shall be as specified in Section 200000.
G. Provide galvanized steel bird screen to protect fan discharge.
H. Provide gravity damper to prevent outside air from entering back into the building when fan is off. Damper shall consist of galvanized frames with pre-punched mounting holes balanced for minimal resistance to flow.
I. Exhaust fans shall be Greenheck, Cook, or Penn.

2.3 BASEBOARD HEATERS (HYDRONIC)

A. Provide baseboard heaters as indicated on the Plans.
B. Heating elements shall have integral fin collars which space the fins to provide fin-to-tube surface firmly bonded by mechanical expansion of the tube. Elements shall be

constructed of seamless copper tubing mechanically expanded into aluminum fins.

C. Enclosures shall be constructed of 16-gauge steel and shall mount into a continuous roll-formed captive channel mounting strip fastening onto rigidized 14-gauge steel enclosure brackets. Front panels shall be individually removable to facility cleaning, servicing, or replacement. Accessories shall fasten to the enclosure assembly in a manner which prevents contact with the back wall during installation.
D. End panels, inside and outside corners and enclosure extensions shall be die-formed and shall lock to enclosure assembly without visible fasteners. Access panels shall be installed where valves, balancing cocks, or traps are indicated on the plans.
E. Cabinet air outlets shall be a bar type extruded aluminum grille.
F. Enclosures, mounting strips and accessories shall be cleaned, phosphatized, and painted with one coat of prime, and a backed enamel finish. Finish color to be selected by Engineer.
G. Hydronic baseboard heaters shall be manufactured by Trane, or similar of Sterling, or Runtal.

2.4 BASEBOARD HEATERS (ELECTRIC)

A. Baseboard heaters shall be complete with 20-gauge steel enclosure, finned grid or sheath type heating element with nichrome embedded wire, remote thermostat, and automatic thermal cutout. Capacities shall be as listed on the Plans.
B. Heaters shall be Berko, Q-Mark, or Markel.

2.5 AIR DEVICES

A. Provide air devices to complete the heating, air conditioning and ventilating systems. Air devices in ceiling shall have flat white lacquered finish unless noted otherwise. Coordinate the appropriate border and mount for the specific application.
B. Air devices shall be as manufactured by Titus, Tuttle & Bailey, Price, Anemostat, Krueger, or Metalaire.
C. Air devices used for relief shall have backdraft dampers installed behind the air device or in the ductwork connected to the device. Damper shall be gravity operated with extruded aluminum frame and blades, metal axles turning in synthetic bearings and have extruded vinyl, polyurethane sponge or neoprene blade seals. Backdraft damper shall be Greenheck model EM, or similar of American Warming and Ventilating, or Ruskin.
D. Square ceiling diffusers shall be of the sizes and mounting types shown on the plans and outlet schedule. The diffuser shall have three (3) cones, which give a uniform face size and appearance when different neck sizes are used in the same area. All cones shall be one piece precision die-stamped; the back cone shall also include an integrally drawn inlet. The two (2) inner cones shall be constructed as a single, removable inner cone assembly for easy installation and cleaning. The inner cone assembly shall have a hole with removable plug in the center to allow quick adjustment of an inlet damper without removing the inner cone assembly. Diffusers shall be constructed of 24-gauge steel. The finish shall be #26 white. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. Round damper shall be constructed of heavy gauge steel. Damper must be operable from the face of the diffuser.

1. Titus TMS

E. Supply air diffusers in the ceiling shall be steel perforated face with adjustable pattern control core baffles above face of diffuser to provide air distribution pattern noted on the Plans. Face shall be removable from the plenum section. Provide with square or round neck duct connection as noted, fitted with opposed blade damper.
    1. Titus PMC
F. Ceiling return/exhaust registers shall be horizontal fixed bar set at 35 degrees or fixed curved bar with opposed blade damper. Register shall be aluminum construction with white finish. Omit damper where indicated as grilles.
    1. Titus 350FL

2.6 DUCTWORK

A. Provide ductwork and plenums of the sizes shown on the Plans and the materials, gauges and construction as listed below.
B. Ductwork shall not be fabricated or installed until clearances and dimensions have been verified in the field. Discrepancies between the duct sizes and configurations shown on the Contract Documents and those required to meet field conditions shall be brought to the attention of the Engineer for his direction. Ductwork fabricated or installed prior to field verification that the ductwork will fit is done at the Contractor's risk and expense.
C. For details of duct construction not specified below refer to the latest editions of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Manuals. Duct systems shall be defined as follows with the applicable manual.
    1. All systems “HVAC Duct Construction Standards” metal and flexible.
D. Ductwork shall be galvanized steel except as specified hereinafter of sizes indicated with sheets shaped and constructed as noted in the SMACNA Manual.
E. Flexible ductwork shall consist of a coated spring steel wire helix, polymeric liner, fiberglass insulation and fiberglass reinforced metallized film vapor barrier. Flexible ductwork shall be listed by Underwriters Laboratories under UL 181 standards as Class I flexible Air Duct Material and shall comply with NFPA Standards 90A and 90B. Flexible duct shall be rated for two inches positive and negative pressure and 2500 fpm maximum velocity. Flexible ducts shall be Thermoflex M-KE, Wiremold or General.
F. Where ducts are noted to be acoustically lined, they shall be lined with one half inch thickness of coated and edge sealed lining system. Liner and insulation shall meet requirements of UL 181 and NFPA 90A/B. Liner shall meet bacteriological standards of ASTM C 1071. Seams and cut edges shall be sealed from airstream using metal brackets. Use of adhesive-backed tape is unacceptable. Insulation shall be 3 lb/cubic foot density with a minimum R-Value of 2.0. Duct sizes shown on Plans are the interior sizes of insulated duct. As a minimum, supply and return ducts from heating, ventilating and air conditioning units for a distance of fifteen feet from the units shall be acoustically lined. Duct lining shall be Owens Corning QuietR Duct Liner or equal of Johns Manville, Certain Teed or Knauf.
G. Ductwork shall be galvanized steel except as specified hereinafter of sizes indicated with sheets shaped and constructed as noted in the SMACNA Manual and of the pressure classification required to meet the pressures listed in the equipment schedules.
H. Duct connections to air handling units and elsewhere as required to compensate for expansion and contraction and noise reduction shall be made with UL approved glass

fabric such as Ventglas as manufactured by Vent Fabrics, Inc.

I. On low pressure systems duct details shall be as follows:
    1. Square elbows Figure 4-2
    2. Hangers Figure 5-1
    3. Tee connections Figure 3-6
    4. Register on trunk Figure 7-6
    5. Volume dampers Figures 7-4 and 7-5

J. Provide manual volume dampers as shown on the Plans and additionally as required to properly balance the air distribution systems as directed by the independent Test and Balance Agency.

2.7 VALVES

A. Provide valves at branch connections to mainline pipelines and at each piece of equipment, arranged so service may be shut off and the equipment removed without disturbing the piping or draining the whole system. Valves at equipment shall be size of line serving the equipment. Install valves in accessible locations.

B. Where valves are over seven (7) feet from floor and will require frequent operation, provide chain wheel, guide and hood or gear operator and chain to permit operation of valve from the floor.

C. Service valves shall be in accordance with following schedule:

	Nibco	Crane	Jenkins	Stockham
Gate – 2″ and smaller	T-111	428	47	B-100
Gate – 2½″ and larger	F-617-0	465-1/2	651A	G-623
Globe - 2″ and smaller	T-211-Y	1	746	B-13T
Globe – 2½″ and larger	F-718-B	351	613	G-512
Check – 2″ and smaller	T-413-Y	34-1/2	92A	B-319

Check - 2½″ and larger	F-918-B	373	624	G-931

Valves on piping 2-1/2 inch and larger shall be flanged. Valves on copper piping shall have solder ends.

E. In lieu of bronze gate valves, bronze ball valves may be used. Valves shall be "Full Port"; NIBCO Figure No. T-585 (1/2 inch to 1 inch) or NIBCO T-595 (1-1/4 inches to 2 inches). Jenkins 900T, Consolidated or Apollo 70-100.
F. Circuit Setter Plus Calibrated Balance valves by Bell and Gossett models RF, MC, CB, shall be used for balancing and shut off valves. Adjustable stop and tapping on the downstream side for pressure gauge connections shall be provided with balancing services.
G. Ball valves may also be used for balancing service, where line velocity does not exceed 10 feet per second. Ball valves must include memory stop; NIBCO Figure No. T-580-M, as shown on the Plans.

PART 3 - EXECUTION

3.1 PIPING

A. Heating system hot water supply and return piping shall be provided as indicated below unless otherwise noted.

1. Piping -black steel, schedule 40

2. Fittings
    a. 2-1/2 inches and larger, black steel welded
    b. 2 inches and smaller, black cast iron banded
3. Unions
    a. 2-1/2 inches and larger, 150-pound slip on forged steel welding flanges with bolts, nuts and gasket
    b. 2 inches and smaller, black malleable iron, ground joint
4. Joints
    a. 2-1/2 inches and larger, welded
    b. 2 inches and smaller, threaded

B. Piping two (2) inches and smaller may, at the Contractor's option, be type "L" hard drawn copper tubing ASTM B.88 made up with wrought copper sweat fittings ANSI A40.3 using 95-5 tin antimony solder.

3.2 PIPING ACCESSORIES

A. Provide piping accessories including thermometers, pressure gauges, specialty items, etc., as specified below and/or indicated on the Plans.
B. Strainers shall be Walworth 3699-1/2, Sarco SB; bronze, smaller than 2-1/2 inches.

Bailey 125-pound No. 100, Zurn 125-pound No. 540 FBS, or Crane No. 989-1/2, cast iron 2-1/2 inches and larger. Provide with small mesh basket during testing and cleaning period. Replace basket prior to air and water balance.

C. Unions shall be installed where required or detailed to permit removal of equipment, control valves, etc., from the piping systems without dismantling the system. Unions shall be malleable iron brass to iron seat, ground joint, same materials as pipe, Crane, Walworth or Jenkins. Provide di-electric fittings where pipe sections and fittings of dissimilar materials are joined.

D. Flexible connections of reinforced rubber or teflon construction shall be provided in suction lines and discharge line to pumps and chillers. Connections shall be arranged to correct minor misalignment, to facilitate disconnecting the piping and to reduce vibration transmission. Flexible connections shall be Resistoflex Corporation, complete with limit bolts and grommets, Mercer or Mason.

E. Combination temperature and pressure tappings shall be 1/4-inch fitting to receive either a temperature or pressure probe, 1/8-inch OD. Fitting shall be solid brass with two neoprene valve cores. Provide two pressure gauge adapters with 1/8-inch probe and two five-inch stem pocket testing thermometers with 0-to-220-degree range. Fitting shall be Pete's plug. At Contractor's option, where thermometer well, pressure gauge tapping and/or flow indicator is required adjacent to a balancing valve, a combination device such as Autoflow FV series or flowset HB/U+ may be substituted.

F. Thermometers shall be 5-inch dial bi-metal with stainless steel case set into separable wells in the piping system. Range for hot water shall be 20-240. Thermometers to be Weksler Economy bottom side or rear mounted to be easily visible from the floor.

G. Water pressure gauges shall be Weksler type P, phenol case 4-1/2-inch range P.S.I.G. dial, with bourdon tube, recalibrating type, black case. Gauges shall be installed on 1/2-inch pipe with gate valve in connection. Equivalent products of Weiss, Manning-Maxwell and Moore “Ashcroft”, Trerice or Marsh will be acceptable.

H. Flow indicators of venturi type or orifice plate type shall be installed where noted on the Plans. Provide two (2) reading devices and the necessary conversion charts. Indicators shall be as manufactured by Taco, Bell & Gossett, or Sarco.

I. Provide automatic air vents at the high points of the piping systems in the mechanical room. Vents shall be piped to the nearest floor drain. Vents to be Fisher, Illinois, or Taco. At the other locations where piping turns down in the direction of flow and at terminal devices, install key operated needle valve air vents.

J. Flow switches shall be McDonnell-Miller FS4, suitable for the diameter of the pipe.

K. Valves and fittings at base mounted pumps may at the Contractor's option, be combined into a suction diffuser on inlet and combination balancing shut- off check valve on discharge, fittings shall be Taco or Bell & Gossett.

L. At the Contractor's option, at equipment such as unit ventilators, unit heaters, heating coils, etc., Autoflow series SV valves or Flowset HB/YS/U+ may be used in lieu of combination shut-off valve, strainer, and temperature-pressure test port on the supply pipe. On the return pipe Autoflow series FV valves or flowset HB/vt may be used in lieu of combination flow control, shut-off and temperature-pressure test port. Valves shall be installed in unit cabinets.

3.3 INSULATION

A. After the systems have been installed and tested, insulation as specified below shall be applied. Materials shall be Underwriters Laboratory, Inc., approved and shall be applied as recommended by the manufacturer's written instructions. Materials used shall be the products of Owens Corning, Manville, Knauff Corporation, Armstrong, Certainteed, Miracle Adhesive, Moneco or Benjamin Foster and shall be similar to those products that meet the specifications below.

B. Ductwork

1. Concealed supply air duct, return air duct, outside air duct, and exhaust duct within apartment units shall be covered with minimum 2-inch thickness of 3/4 PCF density, a minimum R-Value of 6.0 for attic/concealed spaces and R 8.0 for exterior use flexible fiberglass duct covering with reinforced foil and kraft paper vapor barrier FRK jacket. Insulation shall be applied to duct over 100 percent coverage of duct adhesive such as Benjamin Foster 85-20. Edges shall be butted together with a vapor barrier lap of 2 inch minimum. Seal joint and punctures with Benjamin Foster 30-35. Where ducts are over 24 inches in width, weld pins and caps shall be used to secure insulation to underside of duct. Secure laps with adhesive and flared staples on 4-inch center.
2. Ductwork that is internally lined with energy code compliant liner is required to be insulated externally as indicated herein.

C. Piping

1. Hot water heating piping shall be covered with long strand glass fiber insulation with all service vapor barrier jacket with self-sealing pressure sensitive lap, Manville AP-T, of a thickness to be compliant with the applicable energy code requirements. For piping up to 1-1/4 inches in size, the minimum thickness shall be 1-1/2 inches. For piping 1-1/2 inches in size and larger, the minimum thickness shall be 2 inches. Fittings shall be covered with 300 precut PVC fitting covers with fiberglass insulation insert. Cover shall be sealed to adjacent insulation with vapor retarder mastic and then covered with pressure
2. Refrigeration suction piping and condensate drain piping above the ground shall be covered with 3/4-inch thickness of 6 PCF polyethylene foamed closed cell elastomeric pipe covering conforming to Mil Spec 15280, Armstrong Armaflex. Fittings shall be neatly mitered or continuous with piping. Covering on exterior of building shall be finished with two (2) coats of Armaflex or other latex base finish to blend with adjacent finishes.
3. On exposed insulated piping in finished areas within seven feet of the floor, provide 0.010-inch-thick galvanized steel insulation jackets. This does not include piping exposed in unfinished areas such as boiler rooms, storage rooms, etc.
4. At pipe hangers for piping carrying fluids with temperatures below 70 degrees, provide rigid core of insulation to support the pipe. Rigid insulation shall be the same thickness as the adjacent insulation and shall have the same flame spread and smoke developed ratings.

3.4 TESTING AND BALANCING AIR & WATER SYSTEMS

A. The air distribution system shall be balanced and adjusted to distribute the air quantities as noted on the Plans. Demonstrate to the Engineer's satisfaction knowledgeability in this work and familiarity with the test instruments to be used. If the Engineer does not approve of the Contractor's qualifications, the Contractor shall engage the services of an independent test organization specializing in this work and is a member of the Associated Air Balance Council or other nationally recognized air balancing organization.

B. Test equipment must be approved by the Engineer and properly calibrated prior to starting work. Repairs, alterations, adjustments, and readjustments necessary to meet the design conditions shall be made.

C. The balancing agency shall review the Plans before installation and advise the Contractor of additional dampers required in the ductwork, flow devices and balancing valves in the water piping, etc., to effectively and properly balance the systems. These devices shall be installed at no additional cost to the DRBA.

D. At the completion of the balancing and adjusting and prior to the operating test, submit to the Engineer three (3) certified typewritten reports to be retained by the Engineer. Reports shall include:
    1. Velocities and air quantities at supply returns and exhaust outlets installed under this contract.
    2. Pressure and/or temperature difference across various pieces of equipment.
    3. Air temperature delivered from heating and cooling equipment.
    4. Water quantities at flow indicators.
    5. Schedule of equipment.
    6. Speed of belt driven equipment.
    7. Nameplate data on motors installed under this contract.
    8. Actual operating voltage and ampacity readings on motors.
    9. Separate six-hour operating tests shall be made during the cooling season and during the heating season in which an hourly record shall be made of the following:
        a. Settings of control equipment.
        b. Outside weather conditions.
        c. Thermostat readings.
        d. Dry and wet bulb temperatures in spaces.
        e. Outside temperatures shall be below 40 degrees Fahrenheit during the heating test and above 85 degrees Fahrenheit during the cooling test.

E. The outside air quantity for the variable volume air handling units shall be balanced in the following manner:
    1. With the air handling unit operating at maximum air quantity the outside air damper shall be adjusted to the minimum outside air percentage as noted on the Plans. The return air damper shall be adjusted to allow the corresponding return air quantity.
    2. With the air handling unit operating at maximum turn down, the outside air damper shall be adjusted to allow the same quantity of outside air (in cubic feet per minute) as allowed in Step 1 above. The return air damper shall be

adjusted to allow the corresponding return air quantity.

3. The outside and return air dampers shall modulate between the two points described above.

3.5 AUTOMATIC TEMPERATURE CONTROLS

A. Provide labor, materials, equipment, services, etc., to install a system of automatic temperature controls to perform the functions noted on the Plans. Coordinate with unit supplied controls.

B. System shall be DDC and shall be installed under the supervision of the manufacturer's authorized representative.

C. Power source for the system shall be taken from 120-volt sources. Provide motors, starters, overload protection, control power transformers and related wiring devices, etc., in accordance with the applicable requirements of the Sections under Division 26 as appropriate for the voltage used. Interlock wiring to fans, pumps, motors, dampers, valves, etc., shall be provided as part of this work.

D. Automatic dampers shall be furnished by the temperature control manufacturer but shall be installed by the trade normally installing such item, under the supervision of the control manufacturer.

E. The temperature control system, as hereinafter specified and designated on the Plans and plans, shall be guaranteed free of original defects in material and workmanship for a period of two years. After completion of the installation, thermostats, control valves, control motors, dampers, etc., shall be regulated and adjusted to perform the proper function.

F. Prepare a schematic drawing of the temperature control system and submit them to the Engineer for his or her review prior to starting work.

G. Upon completion of the work, revise the diagrammatic layouts to record conditions and mount the revised layouts in clear plastic envelopes where directed.

H. Control devices shall be identified by embossed nameplates to identify control devices as shown on control diagram.

I. Dampers shall be Arrow Foil double seal dampers with a maximum 0.5 percent leakage or Honeywell D642 or D643 Type.

3.6 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.7 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 20 - GENERAL MECHANICAL/PLUMBING. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 20 - GENERAL MECHANICAL/PLUMBING will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 230000

END OF DIVISION 20: GENERAL MECHANICAL/PLUMBING

DIVISION 26: GENERAL ELECTRICAL
SECTION/DESCRIPTION
260000 General Electrical Requirements
260500 Electrical Materials and Methods
265000 Lighting

SECTION 260000

GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Plan and general provisions of the Contract, including General and Supplementary Conditions as specified in the Advertisement for Bids.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for work under all Sections of Division 26.
B. Coordinate the work of this Section with the requirements of the Project.

1.3 DEFINITIONS

A. Following are definitions of terms and expressions used in the Electrical Sections in addition to definitions found in the Contract Conditions of the CSI MasterFormat:
   1. “Wiring” includes wire, fittings, conduit, boxes, and other accessories that comprise a system.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements
   1. Work shall conform to the requirements of the codes, laws and ordinances, National Fire Protection Association, National Electrical Code (NEC), National Electrical Manufacturer's Association (NEMA) and other authorities having jurisdiction.
   2. The requirements of the authorities having jurisdiction shall take precedence over the Plans and Specifications and changes required by the authorities shall be made after review by the Engineer.

1.5 SUBMITTALS

A. Product data and Shop Drawings are required for the following:
   1. Panelboards
   2. Safety Disconnect Switches
   3. Wiring Devices
   4. Circuit Breakers
   5. Lighting fixtures
B. Review of Shop Drawings does not relieve the Contractor of responsibility for complying with the Contract Documents.
C. Material substitutions must be specifically called out in writing on the submittal.

1.6 PROTECTION

A. Protect material and equipment from damage.
B. Cap or plug openings in equipment and conduits with proper caps and plugs.

1.7 VARIANCES

A. Where conflicts exist within the contract documents, request clarification prior to the submission of a bid. If clarification is not requested, provide the work representing the higher cost and quality.

1.8 WARRANTY

A. During the warranty period, make the proper adjustments of systems, equipment and devices installed and perform work necessary to ensure the efficient and proper functioning of the systems, equipment, and devices.
B. Certain items of equipment shall be warranted for a longer time than the general warranty period. Provide for service or replacement required in connection with the warranty of these items.

PART 2 - PRODUCTS

2.1 PRODUCTS TO BE USED

A. Items specified by designations such as trade name, manufacturer's name, and catalog number indicate the capacity and quality of the products or materials to be used on this project.
B. Only products indicated on Contract Documents by name, series and/or model number have been coordinated with other trades. Coordinate items of other manufacturers with other trades, and make any necessary modifications required by use of the alternate product.

2.2 MATERIALS AND WORKMANSHIP

A. Items shown and not specifically called for, or items specified and not specifically indicated or detailed on the Plans, or items neither specified nor shown, but which are reasonably incidental to and commonly required to make a complete job, shall be provided.

2.3 EQUIPMENT SUPPORTS

A. Provide supports as necessary for satisfactory installation and operation of equipment. Furnish and set anchor bolts.

2.4 HANGERS AND CONDUIT SUPPORTS

A. Provide conduit hangers and supports to maintain required alignment for equipment and conduits.

B. Conduits may not be supported from other conduits. Trapeze hangers may be used for parallel runs of conduit.
C. Provide supports for equipment and materials under these Specifications. Supports shall be structural steel shapes (angles, channels) of Kindorf or Unistrut. Minimum rod size shall be 3/8 inch.
D. For wood joist construction, hanger rods shall be supported from wood joists with hangers bolted through or attached with lag crews to the joists.
E. For steel bar joist construction, hanger rods shall be supported from the top chord of the joists or from panel points of the lower chord of the joists. Where conduit runs parallel to joists or where hangers are required at other than joist locations, provide steel angles welded to joists to support hangers so that weight is supported from the top chord of the joists.
F. For poured in place concrete construction, support hanger rods by drilled steel drop-in anchors, wedge anchor or expansion anchor. Zamac type nail in, spike or powder actuated type anchors shall not be used without written approval and permission from building's structural engineer.
G. For existing concrete plank construction or where the concrete topping is less than two (2) inches thick, hangers shall be bolted into planks using toggle bolts. Where these toggle bolts are used, hanger rods shall carry no more than 200 pounds per hanger. The hanger spacing shall be reduced as required to meet this requirement.
H. Expansion bolts or wood plugs will not be permitted in slag block walls. Equipment hung on such walls shall be supported by through bolts or approved anchor bolts set into masonry as the wall is laid up.

2.5 OPENINGS

A. Determine the location and size of openings necessary for the proper installation of the work and provide them during the erection of the work in which such openings occur.
B. In case cutting of building construction is necessary, such cutting shall be done and repaired to match original condition of the work. Do not cut structural members.
C. Where non-combustible conduits pass through sleeves or openings in fire rated wall, floor-ceiling and ceiling-roof assemblies, seal openings with a UL classified firestop method. Firestop method shall be a one part, intumescent (expands with heat), latex elastomer capable of expanding a minimum of three times. Firestop materials shall be UL listed when tested in accordance with ASTM E814 for a two-hour fire (F) and temperature (T) rating.

2.6 ACCESS PANELS

A. In general, boxes, devices and equipment shall be accessible through the removable panels in the ceiling. Where ceilings are not removable and in walls where access is required for service, access panels shall be provided. Access panels shall be appropriate for the finish in which they are installed, with a fire rating to match the wall or ceiling in which they are installed. Refer to other specification section covering access panels.
B. Coordinate with the Sections within Division 20 and Division 26 to group boxes, devices, and equipment together to keep the required number of access panels to a minimum.

2.7 IDENTIFICATION

A. Equipment shall be identified with self-adhesive printed and laminated labels. Letters shall be at least 3/8 inch high and larger in proportion to the size of the piece of equipment. Outdoor labels shall be UV and water resistant. Lettering shall include equipment name, voltage, source panel and circuit number where it is being fed from. Labels shall be provided for the following equipment.
   1. Disconnects
   2. Devices
   3. Panelboards

B. Junction boxes and pull boxes, except those located at the fixture or equipment to which system is connected, shall be identified with permanent marker in large legible lettering to indicate system and circuiting on which installed. In exposed areas mark the inside of the cover.

C. Panels shall be provided with a typed directory listing load served and associated circuit numbers.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

A. Visit the site and become familiar with existing conditions. Modifications to work required to allow for existing conditions shall be provided. Submit proposed modifications to the Engineer for approval prior to installation.

B. Where electrical systems pass through the renovated areas to serve other portions of the premises, they shall be suitably relocated, and the systems restored to normal operation. Any outages in systems shall be coordinated with the DRBA. Where duration of proposed outages cannot be tolerated by the DRBA, provide temporary connection as required to maintain service.

C. Coordinate any power interruptions with the DRBA. Provide temporary connections to maintain operation of existing systems.

D. Relocate existing hangers and supports where necessary to install new work. Maximum spacing requirements shall apply for relocated supports.

E. Where new devices are added to existing walls and ceilings, new wiring shall be concealed by chasing existing walls as required. Devices shall be installed flush.

F. Where new finishes or treatments are added to existing walls and ceilings by the Engineer, provide necessary outlet box extensions, plaster rings, etc., so that devices are installed in the same manner as existing, i.e., flush, concealed, surface, etc.

3.2 DEMOLITION

A. Equipment removed that is salvageable and desired by the DRBA to be retained, shall be stored on the site where directed by the DRBA. Otherwise, other materials and equipment which are removed shall become the property of the Contractor and shall be removed by him from the premises.

B. In each area to be renovated, remove the entire existing electrical installation except those portions indicated to be reused. When existing electrical work is removed, remove conduit, ducts, supports, etc. to a point below the finished floors or behind

finished walls and cap. Such points shall be far enough behind finished surfaces to allow for the installation of the normal thickness of finished material. Unused wiring and cable shall be removed back to source.

3.3 MANNER OF INSTALLATION

A. The Plans showing the layout of the electrical systems indicate the approximate location of outlets and equipment. The runs of feeders and branch circuits as shown on the Plans are schematic only and are not intended to show the routing and location of conduits. The final determination of routing and location shall be governed by structural conditions, obstructions and connection locations on equipment. Detailed drawings showing major deviations shall be submitted to the Engineer for acceptance before such changes are made.

B. The Engineer reserves the right to a reasonable amount of shifting of outlet locations at no additional cost to the DRBA until the time of roughing-in the work.

3.4 RECORD DRAWINGS

A. Keep at the site one (1) set of black and white prints for the express purpose of showing changes from the Plans made during construction. Mark up the prints with red pencil during construction and deliver the prints, before final inspection, to the Engineer as a final set of "Record Drawings". Refer to Division 100 – General Provisions of the Delaware River and Bay Authority Standard Specifications for Road and Bridge Construction for additional requirements.

3.5 TESTING

A. Provide labor, instruments and equipment required for the tests. Make necessary changes to the systems as required to produce the specified results. Retest to the Engineer's satisfaction.

B. Tests shall be conducted before equipment is connected that would be subject to damage from the test.

C. Notify the Engineer of the date and time of the test at least three days prior to that date.

D. The tests shall demonstrate to the satisfaction of the Engineer the following:

1. That circuits are continuous and free from short circuits.
2. That circuits are properly connected.
3. That equipment is fully functional.

3.6 PAINTING

A. Remove rust, scale, grease, and dirt from equipment and material and leave ready for finish painting. Equipment specified with factory baked enamel finish shall be touched up as required to provide a surface visually free of scratches, nicks and blemishes.

3.7 OPERATING AND MAINTENANCE MANUAL

A. Submit operating and maintenance instructions. Unless covered in another specification section, provide a minimum of four copies in three-ring binders and one CD. The manual shall include the following:

1. A brief description of systems and their various components.
2. Full, definite and explicit instructions for starting, stopping, and controlling systems.
3. List of manufacturer's representatives with address and telephone numbers.
4. Manufacturer's printed operating and maintenance instructions, parts lists, illustrations and diagrams for pieces of equipment.
5. A complete schedule of periodic servicing and lubrication requirements for equipment.
6. One (1) copy of each Shop Drawing, Engineer’s Shop Drawing review comments, and Contractor's drawings.
7. One (1) copy of other items of equipment where not required as a Shop Drawing submittal.
8. One (1) copy of each wiring diagram.
9. Manufacturer's data report from UL certifying code compliance for equipment specified.
10. Certificate of approval from the code authority.

3.8 GROUNDING

A. Grounds and connections shall be provided in accordance with the latest provisions of the National Electrical Code, and as indicated on the Plans and specified.
B. Unless otherwise noted, ground conductors shall be of copper, sized as required by the National Electrical Code. Ground lugs and clamps shall be cast non-ferrous metal, bolt-on type.
C. The required equipment grounding conductors and straps shall be sized in compliance with National Electrical Code. Equipment grounding conductors shall be provided with green insulation equivalent to the insulation on the associated phase conductors. The related feeder and the branch circuit grounding conductors shall be connected to the grounding bus with approved pressure connectors.
D. Provided a separate green insulated equipment grounding conductor for each feeder and branch circuit. The required grounding conductor shall be installed in the common raceway with the related phase and/or neutral conductors. Flexible metallic conduit equipment connections utilized in conjunction with the above shall be provided with suitable green insulated grounding conductors connected to approved grounding terminals at ends of the flexible conduit.

3.9 MOUNTING HEIGHTS

A. Mounting heights indicated on the Plans provide a general location of the outlets for bidding purposes only. Where mounting height information is not given, or contradicting information is given, request the information from the Engineer. Field coordinate final location of outlets.

3.10 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.11 BASIS OF PAYMENT.

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 26: GENERAL ELECTRICAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 26: GENERAL ELECTRICAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 260000

SECTION 260500

ELECTRICAL METHODS AND MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENT

A. Plan and general provisions of the Contract, including General and Supplementary Conditions and DRBA Standard Specifications.

1.2 SUMMARY

A. The Work under this Section of the Specification includes the furnishing of labor, materials and equipment for the installation of a complete electrical system as shown and as specified herein.
B. Coordinate the work of this Section with the requirements of the Project.

PART 2 - PRODUCTS

2.1 PANELBOARDS

A. Provide panelboards constructed in accordance with NEMA Standard PB1 and which bear the UL service entrance label.
B. Provide panelboard enclosures as follows:
   1. General interior – NEMA 1 enclosure.
   2. Mounting – as indicated in panel schedules.
C. Indicate circuit number on or adjacent to circuit breakers and provide a typed circuit directory on the inside of panelboard doors which clearly describes the loads served by breakers. Also provide the following information on the directory:
   1. Panel designation.
   2. Voltage, Phase and Amps.
   3. AIC rating.
   4. Feeder and conduit size.
   5. Feeder source and overcurrent protection size.
D. Provide panelboards with copper bus.
E. Provide panelboard assemblies with sufficient ampere interrupting capacity for available fault current. Provide fully rated panelboard assemblies. Series rating is not permitted.
F. Provide bolt-on thermal-magnetic circuit breakers.
G. Provide common trip type two or three-pole breakers. Single pole units with a handle tie are not acceptable. Provide multi-pole breakers for all multiwire branch circuits.
H. Provide circuit breaker type power and distribution panelboards with thermal-magnetic circuit breakers. Breakers feeding HVAC loads shall be HACR rated. When circuit breakers are used in combination with motor starters with overload relay for the protection of motors, provide motor circuit protector (MCP) type breakers with adjustable instantaneous trip which is adjustable and accessible from the front of the circuit breaker.

I. Circuit numbers indicated on branch wiring on the plans are to indicate grouping of loads on circuits and do not necessarily indicate actual circuit numbers in panelboard. Arrange circuits such that loads are balanced as closely as practical over the phases and that a branch circuit neutral conductor does not serve as a shared neutral for two or more single phase circuits connected to the same phase in the panelboard.
J. Panelboards shall be Square D, Siemens, or Cutler Hammer.

2.2 SAFETY SWITCHES

A. General:
    i. Heavy-duty type.
    ii. Cover interlock to prevent operation with cover open.
    iii. Visible blade.
    iv. Externally operated with current carrying parts silver or tin plated.
    v. Provisions for two or more external padlocks.
    vi. Capable of accepting copper or aluminum cables.
B. Enclosure:
    i. NEMA 1 for general interior work.
    ii. NEMA 3R for exterior work and damp locations.
C. Safety switches shall be by Square D, Siemens, or Cutler-Hammer.

2.3 WIRING DEVICES

A. Wiring Devices shall be by Hubbell, Pass & Seymour, or Leviton.
B. Light Switches:
    1. Toggle type.
    2. Back and side wired.
    3. Commercial Specification Grade.
    4. 20 amperes.
    5. 120-277 volts.
C. Receptacles:
    1. Commercial grade, duplex, 20-ampere.
    2. Ground fault circuit interrupter.
    3. Color of receptacles shall be selected by DRBA.
D. Wiring Device Cover Plates:
    1. Indoor use:
        i. Stainless steel.
    2. Exterior use or in damp or wet locations:
        i. Weatherproof covers shall be diecast aluminum.
        ii. U.L. Listed & suitable for wet locations while in use (plug inserted at all times).

2.4 DIMMER SWITCHES

A. Dimmer switches shall be by Lutron, Hubbell, Pass & Seymour, or Leviton.
B. Linear slide type; the slider shall be the captured type.
C. Dimmers shall meet U.L. 20 and U.L. 1472; limited short circuit test requirements for snap switches.

D. Dimmers shall meet ANSI/IEEE Std.C62.41-1980; tested to withstand certain voltages and current surges without damage.
E. Dimmers shall utilize an LC filtering network to minimize interference.
F. Dimmers shall be U.L. listed for their intended use: LED, low-voltage and electronic low voltage.
G. Dimmers shall be provided with power failure memory; when power is interrupted and returned, the lights shall come back to the same light level.
H. At locations where multiple devices are necessary, multi-gang faceplates shall be provided.
I. The Contractor shall be responsible for the coordination of the proper back box size and the faceplate type.
J. Dimmer switches shall be listed for use with specific lighting fixtures being controlled.

2.5 OCCUPANCY SENSOR SWITCHES

A. All switches shall utilize dual technology (passive infrared and ultrasonic).
B. Wall-mount
    1. Wall switch sensors shall be rated for 120/277V operation, 1200VA fluorescent load minimum.
    2. Sensors shall be equipped with the following: manual override switch and control for on/off operation; adjustable timer settings; minimum on time to maximize lamp life and performance; optional ambient light sensing override.
    3. Basis-of-design product is Sensor Switch WSX PDT. Provide this product or approved equal by Leviton, Hubbell, or Watt Stopper.
C. Ceiling-mount
    1. Ceiling sensors shall be rated for 120/277V operation, up to 2000 square feet coverage area, surface-mountable to suspended ceiling.
    2. Provide low voltage power packs as required. Each power pack shall be capable of accepting at least six sensors.
    3. Sensors shall be equipped with the following: adjustable timer settings; self-adjusting technology to minimize nuisance switching; low voltage auxiliary relay/contacts; optional ambient light sensing override.
    4. Basis-of-design product is Sensor Switch CM PDT 10. Provide this product or approved equal by Leviton, Hubbell, or Watt Stopper.

2.6 OCCUPANCY/VACANCY SENSOR SWITCHES

A. Unless otherwise noted, all sensors for interior applications (excluding corridors, stairways, restrooms, primary building entrance areas, and lobbies) shall be wired as vacancy sensors (manual on, automatic off).
    1. Ceiling-mount sensors shall achieve manual-on via manual wall-mount toggle switch wired in series with (and downstream of) occupancy sensor power pack.
    2. Ceiling-mount sensors shall achieve manual-on via low-voltage wall station.
B. All sensors shall utilize dual technology (infrared and ultrasonic).
C. Wall-mount
    1. Wall switch sensors shall be rated for 120/277V operation, 1200VA fluorescent load minimum.

2. Sensors shall be factory set to manual-on operation.
3. Sensors shall be equipped with the following: manual override switch and control for on/off operation; adjustable timer settings; minimum on time to maximize lamp life and performance; optional ambient light sensing override.
4. Basis-of-design product is Sensor Switch WSX PDT SA. Provide this product or approved equal by Leviton, Hubbell or Watt Stopper.

D. Ceiling-mount
1. Ceiling sensors shall be rated for 120/277V operation, up to 2000 square feet coverage area, surface-mountable to suspended ceiling.
2. Provide low voltage power packs as required. Each power pack shall be capable of accepting at least six sensors.
3. Sensors shall be equipped with the following: adjustable timer settings; self-adjusting technology to minimize nuisance switching; low voltage auxiliary relay/contacts; optional ambient light sensing override.
4. Basis-of-design product is Sensor Switch CM PDT 10. Provide this product or approved equal by Leviton, Hubbell, or Watt Stopper.

E. Low Voltage Wall Station
1. Low voltage wall stations shall be configured for manual on operation to comply with energy code requirements. Stations shall include soft-click buttons and LED indicator lights and shall be designed for use with low voltage ceiling sensors and related power packs.
2. Provide 0-10V dimming control where indicated on Plans.
3. Basis-of-design product is Sensor Switch sPODM series. Provide this product or approved equal by Leviton, Hubbell, or Watt Stopper.

2.7 BOXES AND FITTINGS

A. Provide metal boxes manufactured by one of the following:
1. Steel City
2. Raco
3. Thomas & Betts
4. Crouse-Hinds
5. Walker

B. Provide O-Z/Gedney type “FS” or “FD” cast aluminum device boxes, equipped with matching covers for boxes less than 50 cubic inches accommodating wiring devices installed:
1. Flush in exterior locations
2. Exposed on walls of unfinished interior spaces

C. Provide pull boxes, junction boxes and wire troughs indicated in the construction documents or required by field conditions or the National Electrical Code to facilitate wiring installation. Obtain approval prior to installing boxes in finished areas.

D. Provide a four (4) inches square, 1-1/2 inches deep or larger box with appropriate raised covers or plaster rings for flush mounted switches and receptacles.

E. In fire-rated assemblies, install boxes in a manner listed for such purpose.

F. Mount flush boxes in or exposed on walls plumb. Install flush boxes such that the distance between the lip of the box and the wall is less than 1/8 inch. Mount receptacles vertically, unless noted otherwise.

G. Provide gasketed covers for boxes in exterior, damp, or wet locations.

2.8 CONDUCTORS

A. Provide soft drawn, 98 percent conductivity, copper conductors with 600-volt insulation, and manufactured in accordance with the requirements of the National Electrical Code, the Board of Fire Underwriters, A.S.A., N.E.M.A. and I.C.E.A.
B. Provide conductors with 90 °C "THHN-THWN" insulation.
C. Sizes are AWG or kcmil. Minimum size for power and lighting circuits is #12. Minimum size for 120-volt control circuits is #14. Minimum insulation rating of conductors is 600 volts.
D. Unless specifically noted otherwise on Plans, feeders and conduits are sized for copper.
E. Aluminum wire is not permitted.
F. Provide stranded wire for No. 8 and larger. Make conductors continuous from outlet with no splices made except within outlet or junction boxes.
G. A color-coding system shall be as follows throughout the building's network of feeders and circuits and used as a basis of balancing the load. The color code shall be continuous from fixture to fixture or other outlets.

Color System	Phase A	Phase B	Phase C	Neutral
208/120V	Black	Red	Blue	White

G. Provide UL approved "Y-ER-Ease", Buchanan, or Ideal pulling compound. Soap, grease or substances other than specified will not be permitted.

2.9 METAL CLAD CABLE

A. Provide type "MC" cable with galvanized steel armor, "THHN/THWN" 90º C, 600 volts, insulated copper conductors and insulated green grounding conductor.
B. Comply with Federal Specification A-A-59544 and bears the UL label.

2.10 RACEWAYS AND WIRING METHODS

A. Rigid metal conduit (RMC)
   1. Provide threaded heavy-wall conduit and couplings which conform to Federal Specification WW-C-581, as amended, ANSI Standard C80.1 and bear the UL label.
   2. Provide type "A" insulating bushings manufactured by O-Z/Gedney.
B. Electrical Metallic Tubing (EMT)
   1. Provide galvanized EMT which conforms to Federal Specification WW-C-563, as amended, ANSI Standard C80.3 and bears the UL label.
C. EMT Couplings and box connectors:
   1. steel
   2. compression ring type
   3. with insulated throat

4. manufactured by: Thomas & Betts, Raco, and Steel City

D. Flexible metal conduit

E. Provide flexible metal conduit which conforms to Federal Specification, WW-C-566, as amended. The minimum size is 1". Provide Appleton liquid tight gasket assembly and “Sealtite” flexible conduit for flexible connections subject to weather, at liquid-tight equipment, and as noted.

PART 3 - EXECUTION

3.1 EQUIPMENT CONNECTIONS

A. Conduit, outlets, wiring and other necessary fittings or accessories for power connections for heating equipment, fans and special furnishings shall be provided under this Section. Motor and equipment of different ratings shall be furnished and circuit components shall be adjusted accordingly.

B. Make final connections to electrical equipment specified under this Section and other Sections of these Specifications.

3.2 MOTORS, EQUIPMENT, CONTROLS AND CONTROL WIRING

A. Motors, air handling units, compressors, etc., and built-in control devices will be provided under other Sections unless noted otherwise.

B. Provide control connections for devices and equipment.

C. Provide power connections for equipment furnished under other Sections.

D. The installation, connections and operation of controls not noted will be done under other Sections, including provisions for conduits, wiring, outlet boxes, control components and connections.

E. Control wiring shall be in accordance with the Plans and/or manufacturer's certified and approved wiring diagrams.

F. Control wires shall be marked with “E-Z” tape markers at terminal points. Terminal blocks shall be marked to correspond to wire terminated.

G. Provide conduit and wires, install and connect control equipment (starters, push buttons, etc.) and connect motors, air handling units, air conditioning equipment, and built-in control devices, in accordance with wiring diagrams furnished under other Sections.

3.3 CONDUCTOR APPLICATIONS

A. Utilize conduit and wire for circuits in exposed areas, feeders, and where other wiring methods are not specifically allowed by the National Electrical Code, the authority having jurisdiction, or elsewhere in these specifications.

B. Utilize conduit and wire throughout.

C. Wire and cable shall be delivered to the job site in full coils or reels, each bearing a tag containing the UL approval stamp, name of manufacturer, trade name, code, type of wire, and month and year manufactured.

3.4 RACEWAY, CABLE AND WIRING METHOD APPLICATIONS

A. Rigid metal conduit (RMC)
   1. Utilize rigid metal conduit under the following conditions (excluding conduit installed on the dry side of waterproofing membranes):
      i. Exposed in damp or wet locations or outdoor locations.
      ii. Where subject to damage by vehicular traffic.

B. Electrical Metallic Tubing (EMT)
   1. Provide EMT except where other conduit types are required by the NEC, the authority having jurisdiction, or elsewhere in these contract documents.

C. Flexible metal conduit
   1. Utilize flexible metal conduit under the following conditions:
      i. In short lengths for connection to motor terminal boxes, dry transformers, engine generators, and other equipment subject to vibration. Where such equipment is exposed to weather or in damp or wet locations, "Sealtite" or "Liquidtite" flexible conduit shall be employed.
      ii. In lengths as allowed by the National Electrical Code between outlet boxes and recessed lighting fixtures.
      iii. Flexible metal conduit may be used in sizes up to 1-1/4 inches in suspended ceilings, in hollow spaces of precast concrete plank floor systems, and dry wall interior partitions except where prohibited by the NEC.
      iv. Provide 2-screw clamp type or "Tite-Bite" box connectors with insulated throats as manufactured by Thomas & Betts, Raco, Steel City.

D. MC cables:
   1. Utilize MC cables for branch circuits concealed in ceilings, walls, partitions, and crawl spaces.

3.5 WIRING METHODS

A. Conduit and cable methods shall conform to the National Electrical Code requirements and these Specifications and shall produce a complete, safe, well-built electrical system.

B. Conduit sizes shall be in accordance with the National Electrical Code with 1-inch minimum.

C. Conduits passing from heated to unheated spaces, exterior spaces, refrigerated spaces and cold section plenums of air conditioning units shall be suitably sealed by means of sealing fittings to prevent accumulation of condensation.

D. On conduits crossing expansion joints, provide expansion fittings manufactured by O-Z/Gedney.

E. Conduit nipples connecting outlets in adjoining rooms shall be packed with Johns-Manville "Duxseal" after wires are in place to prevent transmission of noise between rooms unless nipples are 12 inches or more in length.

F. Where electrical equipment or material is installed in or through fire-rated building elements, provide appropriate UL-listed firestop material to maintain the rated integrity of the affected surface.

G. Provide fiberglass fire-rated outlet boxes or listed putty pads where required to maintain fire rating of wall.

3.6 FIRE ALARM INSTALLATION

A. Provide non specified equipment required to make system fully functional.
B. Install fire alarm and detection system wiring in designated conduit raceway system.
C. Utilize plenum-rated cable for wiring runs to devices.
D. When notification appliance circuits and any other circuits necessary for the operation of the notification appliance circuits are not installed in a 2-hour rated shaft, enclosure, or stairwell, provide a 2-hour rated cable assembly. Provide the 2-hour rated protection from the point at which the circuits exit the control unit to the point where they enter the notification zone they serve.
E. No wiring other than that directly associated with the fire alarm or auxiliary functions shall be permitted in the fire alarm conduits. Wiring splices shall be avoided. Transposing or changing color coding of wires shall not be permitted. Conductors in conduit containing more than one wire shall be color coded and labeled on each end with "E-Z Markers" or equivalent. Fire alarm junction boxes shall be painted red. Conductors in cabinets shall be carefully formed and harnessed so that each drops off directly opposite to its terminal. Cabinet terminals shall be numbered and coded. Controls, switches, etc. shall be clearly labeled on equipment panels.
F. Location for ceiling mounted equipment shall be coordinated with lights, air outlets and other ceiling fixtures and shall be acceptable to the Engineer and to the authorities having jurisdiction.

3.7 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.8 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 26: GENERAL ELECTRICAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 26: GENERAL ELECTRICAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 260500

SECTION 265000

LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Plan and general provisions of the Contract, including General and Supplementary Conditions and DRBA Standard Specifications.

1.2 SUMMARY

A. Section includes lighting fixtures, LED's, drivers, and backup batteries.
B. Coordinate the work of this Section with the requirements of the Project.

1.3 SCOPE

A. Provide a lighting fixture for each lighting fixture symbol shown on the Plans, of the type and quality described herein and on the Plans. Fixtures shall be installed complete with lamps of the wattage indicated, sockets, housing, driver, backup batteries, shades, diffusers and supports, and wired for operation.

1.4 SUBMITTALS

A. Submit product data for each lighting fixture type, including, but not limited to, catalog cuts, drawings, descriptive matter and lighting performance characteristics as required to completely define the materials and construction details employed, finishes applied, dimensions, hinging, latching and re-lamping provisions, and electrical characteristics. Cut sheets shall indicate all options/accessories being provided.
B. When alternate fixtures than the basis of design are proposed (and allowed by DRBA), submit a photometric plan indicating point-by-point footcandle levels. Photometric plan shall include a schedule indicating all data relevant to the calculation (i.e., file used, LLF, average, avg-to-max, max-to-min, etc.).

1.5 WARRANTY

A. 5-year warranty for all components.

PART 2 - PRODUCTS

2.1 LIGHTING FIXTURES

A. Provide fixtures according to the fixture designation indicated on the plans. Fixture designations are explained and specified in the Lighting Fixture Schedule.
B. Designate lighting fixtures for use as emergency lighting, provide integral backup batteries and separate connection to unswitched circuit to allow for battery charging.
C. Construction Features
    1. General Requirements:

i. Provide galvanized support hangers, channels and bolts.
ii. Provide rustproof hardware such as screws, nuts, washers and anchor bolts.
iii. Fixtures shall be wired for polarized system with one wire in each fixture to be distinctly marked for its entire length. Wire shall bear the UL label.
iv. Verify fixture finishes with Engineer prior to ordering.

2.2 LED FIXTURES

A. General
1. Individual LEDs shall be connected such that a catastrophic loss or the failure of one (1) LED will not result in the loss of the entire luminaire.
2. Lumen output shall not decrease by more than 20% over the minimum operational life of 50,000 hours.
3. Provide thermal management of sufficient capacity to ensure proper operation of luminaire over its expected useful life. Thermal management shall be passive type only.
4. Operating temperature range shall be -40°C to 40°C minimum for entire fixture including LED's, drivers, and batteries.

B. Driver
1. 120-277V, UL-listed, CSA-certified. Driver shall be at least 80% efficient at full load.
2. Driver shall be suitable for continuous dimming without perceivable flicker over a range of 100% to 5% of rated lumen output with a smooth shutoff function.
3. Provide driver disconnect per NEC requirement.
4. Provide surge protection internal to driver to protect driver in accordance with ANSI/IEEE C64.41 2002.
5. Driver shall be tested and certified to NEMA 410 standard.

C. Batteries
1. RoHS, cURus 1310, cURus 924, CEC Title 20, Dry and Damp Locations.
2. Batteries shall have capacity to provide minimum of 90 minutes operation at rated lumens during normal power outage.
3. Battery Over Discharge Protection, Output Short Circuit Protection, and LED Red/Green Stainless Steel Test Switch.
4. Input: 100-277VAC, 50/60Hz, 0.1A maximum, 6W maximum, 2.5KV Ring Wave Input Surge Protection.
5. Output: Constant current, LED Class 2
6. RFI/EMI: FCC Part 15 Class A
7. Battery Type: LiFePO 4 (Lithium Iron Phosphate, LFP)
8. Life: 50,000 Hours

2.3 EXIT SIGNS

A. Provide AC-powered exit signs, UL 924-listed.
B. Exit signs shall have universal faces, universal chevrons, and universal mounting.

PART 3 - EXECUTION

3.1 LOCATION

A. Coordinate the location of lighting fixtures with the Engineer before final installation. Allow for a reasonable amount of shifting of fixture locations.
B. Consult the Engineer's reflected ceiling plans and the installer of the ceilings to ensure that fixtures are properly aligned, ventilated and located.
C. Coordinate actual fixture depths with piping, duct work, bulkheads, etc. prior to rough-in.
D. Install exit signs above a doorway with two active leafs that swing in opposite directions centered above egress leaf, not centered above the doorway.

3.2 INSTALLATION

A. Provide “Earthquake” hold down clips on recessed fixtures.
B. Provide necessary accessories, as required, to support the fixtures independently of the ceiling suspension system. Securely fasten box and fixture supports to structural system main supports. Where fixtures are surface mounted, cut neat holes in the hung ceilings as required for the fixture supports.
C. Provide at least two (2) grid drop wires, 12 gauge minimum, supported from building structural system on recessed fixtures. Provide additional support wires where required by AHJ.
D. Lighting fixtures installed in rated walls or ceilings shall be listed for the purpose or suitably labeled with approved material.
E. Provide spring loaded sockets and acrylic tube guards on fluorescent lighting fixtures with exposed tubes. Provide tube guards on all lighting fixtures in food service areas, elevator pit, and elevator machine room.
F. Install and ensure all lighting fixtures are oriented in the same direction.
G. Wire emergency and exit lighting fixtures with unswitched circuit leg, unless otherwise noted.
H. Test all fixtures for proper operation and correct any deficiencies or defective work resulting from deviations from the requirements of the Contract Documents at no additional cost or delays.

3.3 METHOD OF MEASUREMENT

A. Measurement of work performed under this Section will be made on a monthly basis.

3.4 BASIS OF PAYMENT

A. Payment for all work performed under this Section shall be considered incidental to Lump Sum Pay Item: DIVISION 26: GENERAL ELECTRICAL. Payment for work shall include full compensation for performing the work specified and furnishing all materials, labor, tools, equipment, and incidentals necessary to complete the work described in the Contract Documents. Payment for Pay Item: DIVISION 26: GENERAL ELECTRICAL will be made on a monthly basis, based on percent completion of the work as determined by the Engineer.

END OF SECTION 265000

END OF DIVISION 26: GENERAL ELECTRICAL

[End of Special Provisions - Part IV]

DELAWARE RIVER AND BAY AUTHORITY

CAPE MAY-LEWES FERRY

CONTRACT NO. CMLF-C19-06

CAPE MAY TERMINAL
POLICE DISPATCH CENTER REHABILITATION

* * * * * * * * * *

ATTACHMENT A

Plans

Project Plans are located in the CapEx Project File