SCOPE COMPLEX IMPROVEMENTS PHASE 1

FOR

CITY OF NORFOLK – DEPARTMENT OF PUBLIC WORKS
NORFOLK, VIRGINIA

PROJECT MANUAL

VOL 1 of 2 (Div. 0 – 7)

JANUARY 11, 2016

Architect's Project No. 521650

MOSELEYARCHITECTS

ARCHITECTURE, PLANNING, INTERIORS, PROGRAMMING
POPULOUS
300 WYANDOTTE, SUITE 200
KANSAS CITY, MISSOURI 64105
(816) 221-1500

CIVIL & SURVEY ENGINEER
VANASSE HANGEN BRUSTLIN, INC.
2 COLUMBUS CENTER
4500 MAIN STREET, SUITE 400
VIRGINIA BEACH, VA 23462
(757) 490-0132

SLOPED GLAZING SYSTEM
HEITMANN AND ASSOCIATES
14500 S. OUTER FOURTY RD, SUITE 110
CHESTERFIELD, MISSOUR 63017
(314) 439-1944

MECHANICAL, ELECTRICAL, PLUMBING & FIRE PROTECTION ENGINEER
MOSELEY ARCHITECTS
3200 NORFOLK STREET
RICHMOND, VA 23230
(804) 794-7555

STRUCTURAL ENGINEER
STROUD PENCE STRUCTURAL ENGINEERS
5032 ROUSE DRIVE
VIRGINIA BEACH, VA 23462
(757) 671-8626

ARCHITECT OF RECORD
MOSELEY ARCHITECTS
780 LYNNHAVEN PARKWAY, SUITE 200
VIRGINIA BEACH, VA 23452
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COMMONWEALTH OF VIRGINIA
01/11/2016
DAVID W. ANDREA
Lic. No. 2215
LAND SURVEYOR

COMMONWEALTH OF VIRGINIA
1-11-2016
JEFFREY M. HYDER
LIC. No. 010817
ARCHITECT

COMMONWEALTH OF VIRGINIA
JUSTIN D. TRENT
Lic No. 047780
1-11-16
PROFESSIONAL ENGINEER

COMMONWEALTH OF VIRGINIA
JASON P. FORSYTH
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PROFESSIONAL ENGINEER

COMMONWEALTH OF VIRGINIA
HAROLD A. LANNA
Lic. No. 13231
01/11/2016
PROFESSIONAL ENGINEER

CITY OF NORFOLK

SCOPE COMPLEX IMPROVEMENTS
PHASE 1

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Posted: January 15, 2016

INVITATION FOR BIDS
CITY OF NORFOLK - DEPARTMENT OF PUBLIC WORKS

PROJECT: **SCOPE COMPLEX IMPROVEMENTS – PHASE 1**

Owner:	City of Norfolk Department of Public Works Room 700, 7th floor, City Hall Building 810 Union Street, Norfolk, VA 23510 Contact: Robert Jackson, RA Tel: (757) 664-4608 / Fax: (757) 664-4603	A&E:	Moseley Architects 780 Lynnhaven Pkwy., Suite 200 Virginia Beach, VA 23452 Contact: Patrick Ramirez Tel: (757) 368-2800

****

Sealed bids are to be received in City of Norfolk Public Works Department, Attn: Contracts Office, Room 700, 7th floor, City Hall Building, 810 Union Street, Norfolk, VA 23510 until **2:00 p.m., Tuesday, February 23, 2016,** for the above titled Project. **A Pre-Bid Conference will held at 2:00 p.m., Tuesday, February 9, 2016 at Scope, 201 E. Brambleton Ave., Norfolk, Virginia 23510. Interested parties shall meet inside at the Box Office. Attendance is non-mandatory but highly recommended.**

The Work under this project consists of expanding the concourse of Scope Arena. Work includes, but not limited to, adding concession areas, restroom facilities, renovating existing restroom facilities, meeting rooms, and expanding the curtain wall system on the plaza deck.

Bidding Documents are available from the Department of Public Works, provided on a CD, upon non-refundable payment of **$5.00 per set** in the form of a check made payable to Treasurer, City of Norfolk.

A copy of the Bidding Documents will be on file and open to inspection at The Builders and Contractors Exchange, Inc., Norfolk, VA (757-858-0680) and the City of Norfolk web site www.norfolk.gov/bids.aspx.

A Bid Bond, certified check, or cashier's check made payable to the Treasurer, City of Norfolk, for 5% of total bid must accompany each bid. State Contractor registration class and number is required on the outside of the envelope. State Contractor registration class and number is required on the outside of the envelope. The City reserves the right to cancel the bid opening or to reject any or all bids in whole or part, when it is in the best interest of the City. The right to waive informalities and to determine responsiveness of any bid and responsibility of all bidders is reserved to the City. Withdrawal of bids will be in accordance with Section 33.1-42.1 of the Norfolk City Code and Section 11-54 of The Code of Virginia, 1950 (as amended).

David L. Ricks, P.E.
Director

The Virginian Pilot – January 17, 2016
DemandStar – January 17, 2016

INSTRUCTIONS TO BIDDERS

1. AUTHORIZATION TO TRANSACT BUSINESS IN THE COMMONWEALTH

(a) Bidder or offeror organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50 to include in its bid or proposal the identification number issued to it by the State Corporation Commission.

(b) Any bidder or offeror that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law shall include in its bid or proposal a statement describing why6 the bidder or offeror is not required to be so authorized.

2. SUBMISSION OF BIDS

(a) Make all bids on "Bid Form" and seal in opaque envelope. The name of project, the contractor's name, address, and Virginia Contractor Registration Class and Number shall be placed on the outside of the envelope.

(b) If a contract is for $120,000.00 or more, or if the total value of all such construction, removal, repair, or improvements undertaken by the bidder within any 12 month period is for $750,000.00 or more, the bidder is required under Title 54, Chapter 11, Code of Virginia, 1950 (as amended), to show evidence of being licensed as a Class A Contractor. If a contract is $7,500.00 or more, but less than $120,000.00, or if the total value of all such construction, removal, repair or improvements undertaken by the bidder within any 12 month period is less than $150,000, the bidder is required to show evidence of being licensed as a Class B Contractor. If a contract is $1,000 or more, but less than $7,500, or if the total value of all such construction, removal, repair or improvements undertaken by the bidder within any 12 month period is less than $150,000, the bidder is required to show evidence of being licensed as a Class C Contractor. The bidder shall place on the bid above its signature its Virginia Contractor Registration Class and Number. If a contract is less than $1,000.00, licensure is not required under Title 54, Chapter 11, Code of Virginia, 1950 (as amended).

(c) If bids are submitted by mail, enclose the above noted envelope in a second sealed, opaque envelope and address to: **City of Norfolk, Department of Public Works, Attn: Contracts Office, Room 700, 7th floor, City Hall Building, 810 Union St., Norfolk, VA 23510.** Bids submitted by mail must be received at the above address before the time designated for bid opening.

(d) Fully fill in all blanks in ink or typewritten**,** and state numbers in both writing and figures. Signatures shall be in longhand with name and title printed below. Bidders shall acknowledge all addenda in spaces provided on the bid form. For unit price contracts, in the event of a discrepancy between the Total Base Bid and the total of the extension of unit prices, the total extension of unit prices governs in determining the bid amount. For unit price contracts, in the event of a discrepancy between the extension of unit prices and the unit prices, the unit prices governs in determining the bid amount.

(e) Interlineations, alterations, and irregularities of any kind may be cause for rejection of the bid. Erasures or any physical changes on the form shall be initialed by the Bidder.

(f) Bidders may withdraw a bid after it has been submitted to the City any time prior to the stipulated time for opening such bids. Withdrawal of bids will be in accordance with Section 33.1-42.1 of the Norfolk City Code and Section 2.2-4330 of the Code of Virginia, 1950 (as amended).

3. EXAMINATION OF SITE

The bidder shall be responsible for having ascertained all pertinent local and existing conditions determinable by inspection and inquiry both on the site and adjacent thereto, including any other work being performed thereon, and shall include in its bid all cost attendant upon problems arising from said conditions existing at the time of submission of its bid.

Reference is made to the Contract Documents for information relating to reports, explorations, underground facilities, and easements. On request, the owner will provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests and studies as each Bidder deems necessary for submission of a Bid. The Bidder must fill all holes, clean up, and restore the site to its former condition upon completion of such explorations, investigations, tests and studies, and hold the Owner harmless from any damage to property or injury to persons resulting from or arising out of such explorations, investigations, tests, and studies.

4. INQUIRIES, INTERPRETATION AND ADDENDA

Should a bidder find discrepancies in, or omissions from, the drawings or documents, or should it be in doubt as to their meaning, it should at once notify the Architect, in writing, utilizing the Prebid Question Form. The Architect will welcome such inquiries and they will be given consideration. Every interpretation made by the Architect may or may not be in the form of a printed addendum which will be on file in the office of the Architect and Owner. All addenda will be posted to the Owner's web site, www.norfolk.gov/bids.aspx but it will be the bidder's responsibility to know of, examine and become familiar with all addenda issued. All addenda shall become a part of the Contract Documents. The Architect and Owner will not be responsible for any oral instruction modifications and interpretations.

The submission of a Bid will constitute inconvertible representation by the Bidder that the Bidder has complied with every requirement of this Section, that without exception, the Bid is premised upon the agreement by the Bidder to perform the Work required by the Contract Documents, and applying specific means, methods, techniques, sequence or procedures of construction (if any) that may be shown or indicated or expressly required by the Contract Documents, that the Bidder has given Written Notice to the Architect of all conflicts, errors, ambiguities, and discrepancies that the Bidder has discovered in the Contract Documents and the written resolutions thereof by the Architect is acceptable to the Bidder, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions of performance and furnishing the Work.

LAST DAY TO SUBMIT RFI'S IS FEBRUARY 16, 2016. The City cannot guarantee a response for any RFI submitted after this date.

5. BID GUARANTEE

Bids shall be accompanied by a bid guarantee of five percent (5%) of the amount of the total bid including all additive alternates, if any, and may be a certified check or cashier's check or a Bid Bond, made payable to**: Treasurer, City of Norfolk.** Such bid bond or check shall be submitted with the understanding that it shall guarantee that the bidder will not withdraw its bid during the period of sixty (60) days following the opening of bids; that if its bid is accepted, it will enter into a Contract with the Owner in accordance with a form of agreement acceptable to and approved by the Owner and that the required Performance and Payment Bonds will be given; and that in the event of the withdrawal of said bid within said period, or failure to enter into said contract and given said bonds within ten (10) days after it has received notice of acceptance of its bid, the bidder shall be liable to the Owner for the full amount of the bid guarantee as representing the damage to the Owner on account of the default of the bidder in any particular thereof. The bid bonds and checks will be returned to the bidders after the Owner and the lowest, responsive, responsible bidder have executed a contract. If the required contract has not been executed within sixty (60) days after the date of the opening of the bids, then the bond or check of any bidder will be returned upon its request, provided it has not been notified of the acceptance of its bid prior to the date of such request.

6. PERFORMANCE AND PAYMENT BOND

The Contractor shall furnish a performance bond and a labor and material payment bond each in the amount of 100% of the contract price. Said bonds shall be delivered to the Owner (in duplicate) and shall be approved by the Owner prior to the execution of a construction contract between the Contractor and the Owner. Bonds shall be City of Norfolk standard form and shall be in accordance with Section 33.1-76 of the Norfolk City Code. All costs of

bonds shall be paid by the Contractor. A bond rider will be required should change orders increase the amount of the contract by $100,000 or more.

7. NEGOTIATIONS WITH APPARENT LOW BIDDER

The City reserves the right to negotiate with the lowest, responsive, responsible bidder if the bid exceeds available funds. Negotiations may include reduction in bid price, modification and/or reduction in scope of the work, substitution of materials, or any other alterations to the work so that the low bid is reduced to within available funds including a reasonable fund balance for contingency funds to be available during the course of construction.

8. TIME OF COMPLETION

(a) Time is of the essence. All work shall be completed within **Five Hundred Eighteen (518)** calendar days from the Notice to Proceed for Base Bid Work or **Six Hundred Forty (640)** calendar days from the Notice to Proceed for Base Bid Plus Alternates. Work shall commence within (10) ten days from date of Notice to Proceed.

(b) Work shall not commence until the Contractor has received a fully executed copy of the Contract which authorizes the Work and has also received a Notice to Proceed issued by the authorized City representative. Work commenced prior to receipt of both a fully executed copy of the Contract and a written Notice to Proceed from an authorized City official shall be deemed unauthorized and such work will progress solely at Contractor's risk.

9. NON-DISCRIMINATION CLAUSE

The Contractor agrees to comply, and to require all suppliers and subcontractors paid in whole or in part from funds made available under this contract to comply with Section 122(a)(1) of the State and Local Fiscal Assistance Act of 1972 (P. L. 92-512), as amended, to wit:

"No person in the United States shall, on the grounds of race, color, national origin, or sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity of a State government or unit of local government, which government or unit receives funds made available under Subtitle A (of Title I of the Act.)

Any prohibition against discrimination on the basis of age under the Age Discrimination Act of 1975 or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973 shall also apply to any such program or activity.

Any prohibition against discrimination on the basis of religion, or any exemption from such prohibition, as provided in the Civil Rights Act of 1964 or Title VIII of the Act of April 11, 1968, hereafter referred to as the Civil Rights Act of 1968, shall also apply to any such program or activity."

Further, the Contractor agrees to comply with Section 33.l-53 of the Code of the City of Norfolk, Virginia 1979, as amended, regarding prohibited employment discrimination.

10. MINORITY BUSINESS CLAUSE

It is the policy of the City of Norfolk to facilitate the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities and to encourage their participation in the City's procurement activities. Toward that end, the City encourages these firms to compete and encourages non-minority firms to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other contractual opportunities. Bidders (offerors) are asked, as part of their submission, to describe any planned use of such businesses in fulfilling this contract.

11. NON-COLLUSION AFFIDAVIT

(a) Every bidder, by submitting a bid, shall be deemed to covenant, with regard to said bid, as follows:

(1) that said bid was arrived at independently without collusion, consultation, communication, or agreement for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor.

(2) that, unless otherwise required by law, the prices which have been quoted in the bid submitted have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor.

(3) that no attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

A bid shall not be considered for award nor shall any award be made where the bidder shall have failed to comply with a(1), a(2), or a(3) above.

(b) Every bidder, in addition to making the above covenants (a)(1), (a)(2) and (a)(3) will be required to provide the City of Norfolk, with the bid submitted, the affidavit contained herein.

(c) Every bidder will be required to disclose, with the submitted bid, the following information:

(1) the correct mailing address of the bidder.

(2) if a corporation, the name and current mailing address of the President, the Secretary and the Treasurer of the corporation.

(3) if a partnership, proprietorship or other firm, the name and current mailing address of each partner, proprietor or member of said firm.

(4) whether or not the bidder is associated with; owns, in whole or in part; or is owned, in whole or in part, or is a subsidiary of, any other bidder.

(d) The fact that a bidder (1) has published price lists, rates or tariffs covering items included in the submitted bid; (2) has informed prospective customers of proposed or pending publication of new or revised price lists for such items; or (3) has sold the same items to other customers at the same prices being bid, does not constitute a disclosure within the meaning of Subparagraph 9(a).

(e) Any bid submitted by a corporate bidder shall be deemed to have been authorized by the Board of Directors of the bidder and such authorization shall be deemed to include the signing and submission of the bid and the execution of the affidavit required in (b) above as the acts and deeds of the corporation.

12. SUBSTANCE ABUSE AND DRUG-FREE WORK PLACE

The Contractor agrees to comply with Section 33.1-58 of the Code of the City of Norfolk, Virginia, 1996, as amended, regarding substance Abuse and Drug-Free Work Place Policy.

End of Page

Bids to be opened:	**2:00 p.m., Tuesday**
	February 23, 2016
Work to be Completed in:	**518 calendar days**
	640 calendar days with Alternates
Liquidated Damages:	**$1,350.00 per day**
Performance Bond:	**100%**
Payment Bond:	**100%**
Bid Bond:	**5%**

BID FORM

To: City of Norfolk
Department of Public Works
810 Union Street, Room 700
Norfolk, Virginia 23510

A. **LUMP SUM BID**

In compliance with the Invitation for Bids and Instructions to Bidders, the General Conditions of the Contract, the contract drawings and specifications titled **SCOPE COMPLEX IMPROVEMENTS – PHASE 1** and all addenda issued to date, all of which are part of this bid, the undersigned hereby proposes to furnish all items, including materials, labor, and equipment called for by, and in strict accordance with Contract Documents for the sum of:

BASE BID

$_____

(Use words)

_____Dollars ($_____)

ALTERNATES:

1. Renovate Lower Concourse Men and Women's Restrooms

$_____

(Use words)

_____Dollars ($_____)

2. Renovate Exhibition Hall Lobby

$_____

(Use words)

_____Dollars ($_____)

3. Renovate Concourse Men and Women's Restrooms

$_____

(Use words)

_____Dollars ($_____)

4. Renovate Meeting Rooms 1, 2, 3, and 4

$_____

(Use words)

_____Dollars ($_____)

TOTAL BID (BASE BID + ALTERNATES 1, 2, 3, AND 4)

$_____

(Use words)

_____Dollars ($_____)

BID AWARD SHALL BE BASED UPON THE LOWEST RESPONSIVE AND RESPONSIBLE TOTAL BID AMOUNT WHETHER THE CITY ELECTS TO USE THE ALTERNATES OR NOT.

B. **ADDENDA**

The undersigned acknowledges receipt of the following addenda:

Addendum No._____Dated:_____

Addendum No._____Dated:_____

Addendum No._____Dated:_____

Addendum No._____Dated:_____

We agree to enter into a contract with the City of Norfolk, Virginia within ten (10) days of the award of same to us for the price named in our bid.

It is expressly agreed by us that the City of Norfolk, Virginia shall have the right to reject any and all bids and to waive any informalities.

In default of the performance on our part of the conditions of bid, our failure to enter into a contract with the City of Norfolk, Virginia, within the time above set, we herewith furnish a certified check, cashier's check (or Bid Bond) in the amount of $_____, which shall be forfeited as liquidated damages to the City of Norfolk, Virginia, but otherwise the said check or Bid Bond shall be returned.

We agree to begin work at any time after receipt of the Notice to Proceed from the Director of Public Works and substantially complete all of the Work within **Five Hundred Eighteen (518) consecutive calendar days** from the Notice to Proceed or **Six Hundred Forty (640) consecutive calendar days with Alternates** from the Notice to Proceed.

C. Norfolk Businesses: It is the policy of the City to support Norfolk businesses and workforce development and it encourages companies with corporate offices in Norfolk and which employ Norfolk residents to compete for City contracts. Bidders are asked, as part of their submission, to advise of their Norfolk location and detail their employment of Norfolk residents.

D. Equal Opportunity Business Development: It is the policy of the City of Norfolk to facilitate the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities and to encourage their participation in the City's procurement activities. Toward that end, the City encourages these firms to compete and encourages non-minority firms to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other contractual opportunities. Bidders (offerors) are asked, as part of their submission, to describe any planned use of such businesses.

1. Is your firm a minority owned business? Yes ___ No ___ If yes, please check the appropriate category: ___ African American (male), ___ African American (female), ___ Caucasian (female), ___ Hispanic (male), ___ Hispanic (female), ___ Asian American (male), ___ Asian American (female), ___ American Indian (male), ___ American Indian (female), ___ Eskimo (male), ___ Eskimo (female), ___ Aleut (male), ___ Aleut (female), ___ Other (male), ___ Other (female).

2. Subcontracting Opportunities for Small, Women Owned, Minority Business Enterprises and Disabled Veterans. All prime contractors are requested to furnish the following information regarding participation of small, women owned, minority business enterprises and disabled veterans:

a. Proposed Name of your Subcontractor(s):

b. Proposed Minority Category of Subcontractor(s) - please check the appropriate category(ies):

___ African American (male)	___ African American (female)
___ Hispanic (male)	___ Hispanic (female)
___ Asian American (male)	___ Asian American (female)
___ American Indian (male)	___ American Indian (female
___ Eskimo (male)	___ Eskimo (female)
___ Aleut (male)	___ Aleut (female)
___ Other (male)	___ Caucasian (female)
	___ Other (female)

c. Proposed Amount of Subcontracts:

d. Proposed Description of commodity (i.e. masonry, hauling, insulation, etc.):

e. Proposed Description of Project:

f. Proposed Total value of awards to all subcontractors:

g. Proposed Total Number of minority subcontracts awarded:

h. If you do not propose the use of any subcontractors, please check here ____.

E. The undersigned has read all sections under "Instructions to Bidders."

F. **CONTRACTOR'S REGISTRATION AND SIGNATURE**

Registered Virginia Contractor Class and No._____

City of Norfolk Business License No. _____

Contractor_____ Signed_____ (SEAL)

Date_____ Title_____

NOTE: If Bidder is a corporation, write state of incorporation under signature and if a partnership, give full names of all partners.

End of Page

AFFIDAVIT

City of Norfolk, Virginia project: **Scope Complex Improvements – Phase 1**

Bid Date:_____

STATE OF VIRGINIA
(City/County)

This day personally appeared before the undersigned, a Notary Public in and for the City/County and State aforesaid, _____, who having been first duly sworn
(name of owner, partner, president)
according to law, did depose and aver as follows:

(a) That he is_____
(owner, partner, president, etc.)

of_____
(insert name of contractor)

(b) That he is personally familiar with the bid of _____
(insert name of contractor)
submitted in connection with the above captioned City of Norfolk project.

(c) That said bid was formulated and submitted in good faith as the true bid of said bidder.

(d) That said bid in no manner violates the Sherman Antitrust Act (15 U.S.C. '1 *et seq*.), The Virginia Antitrust Act (n59.1-9.1 through n59.1-9.17 Code of Virginia, (1950), as amended) or the Conspiracy to Rig Bids to Government Act (nn59.1-68.8, Code of Virginia (1950), as amended.

And further this deponent saith not.

_____
Affiant

Subscribed and sworn to before me this_____day of_____, 20___.

My commission expires:_____, 20___

_____
Notary Public

MAILING ADDRESS, FAX, TELEPHONE NUMBER and EMAIL OF BIDDER:

_____

_____

_____

IF CORPORATION, PROVIDE NAME AND MAILING ADDRESS AS REQUIRED BELOW

PRESIDENT	SECRETARY	TREASURER
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

IF PARTNERSHIP, PROPRIETORSHIP, OR OTHER FIRM, PROVIDE NAME AND MAILING ADDRESS OF EACH PARTNER, PROPRIETOR, OR MEMBER OF FIRM.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

End of Page

COMPLIANCE WITH STATE LAW

AUTHORIZATION TO TRANSACT BUSINESS IN THE COMMONWEALTH

I. **CERTIFICATION**

A. The Bidder/Vendor (Please fill in with your enterprise's complete name)

_____

certifies that it is organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50.

The identification number issued to Bidder/Vender by the State Corporation Commission: _____

B. Bidder/Vendor that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law shall describe why it is not required to be so authorized:

_____

_____

_____

Bidder/Vendor:_____

Signed: _____

Title: _____

Date: _____

II. **INSTRUCTIONS**

a. The Bidder/Vendor shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Vendor learns that its certification was

erroneous when submitted or has become erroneous by reason of changed circumstances.

b. A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Bidder's/Vendor's responsibility. Failure of the Bidder/Vendor to furnish a certification or provide such additional information as requested by the appropriate City purchasing official may render the Bidder/Vendor non-responsible.

c. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of a Bidder/Vendor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

d. The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Bidder/Vendor knowingly rendered an erroneous certification, in addition to other remedies available to the City, the appropriate City purchasing official may terminate the contract resulting from this solicitation for default.

End of Page

THE CITY OF NORFOLK, VIRGINIA

OFFICE OF THE CITY MANAGER

CONTRACT

THIS AGREEMENT, made as of the **____** day of **_____** in the year **2016**, is between the **City of Norfolk, Virginia**, acting by and through the City Manager, hereinafter styled the **City**, and

party of the second part, hereinafter styled the **Contractor**.

WITNESSETH, That whereas the City has awarded to the Contractor, in accordance with his bid of **February 23, 2016** a contract for **SCOPE COMPLEX IMPROVEMENTS – PHASE 1** as described in specifications and drawings prepared therefor by **Moseley Architects, 780 Lynnhaven Parkway, Suite 200, Virginia Beach, Virginia 23452** hereinafter styled the Engineer, or by the City of Norfolk, and on file in the office of the Director of Public Works of the City of Norfolk, Virginia.

ARTICLE 1 - THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 2 - DATE OF COMMENCEMENT AND COMPLETION TIMES

The Contractor further agrees to begin Work at such a date as the Director, Department of Public Works, Norfolk, Virginia, shall notify it to begin via a Notice to Proceed letter, and that it will achieve Substantial Completion of the entire Work in accordance with Paragraph 9.8 of the General Conditions not later than **Five Hundred Eighteen (518) consecutive calendar days for Base Bid or Six Hundred Forty (640) consecutive calendar days for Base Bid plus Alternates** from the date of commencement as well as achieve Final Completion in accordance with Paragraph 9.10 of the General Conditions not later than **Five Hundred Seventy Eight (578) consecutive calendar days for Base Bid or Seven Hundred (700) consecutive calendar days for Base Bid plus Alternates** from the date of commencement. Additional commencement/completion requirements are outlined in Technical Specifications Section 011000 so as to not conflict with any Event.

ARTICLE 3 - LIQUIDATED DAMAGES

The Contractor and the City recognize that time is of the essence of this Agreement. In view of the difficulty of ascertaining the loss which the City will suffer by reason of delay in the performance of the Work, the Contractor and the City hereby agree upon as the liquidated damages set below that the City will suffer by reason of delay and/or default, and not as a penalty. Further, the City shall deduct and retain the amount of such liquidated damages out of the moneys which may be due or become due to the Contractor under this Agreement.

Accordingly, should the Contractor fail to achieve Substantial Completion the aforesaid Work in accordance with the contract documents to the satisfaction and approval of the Engineer within the time stipulated in Article 2 above, the Contractor shall pay to the City of Norfolk, Virginia, **One Thousand Three Hundred Fifty Dollars ($1,350.00**) for every calendar day beyond the time set for substantial completion.

After Substantial Completion, if the Contractor shall neglect, refuse, or fail to complete the remaining Work within the contract time or any proper extension thereof granted by the City, the Contractor shall pay the City **One Thousand Five Hundred Dollars ($1,500.00**) for every calendar day beyond the time set for final completion until the Work is completed and ready for final payment.

ARTICLE 4 - CONTRACT PRICE

The City shall pay the Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined below subject to additions and deductions as provided in the Contract Documents:

For all Work other than Unit Price Work, a lump sum of:

_____ Dollars and ___ Cents ($XXX.XX)

All specific cash allowances are included in the above price and have been computed in accordance with Paragraph 3.8 of AIA A201-2007, General Conditions of the Contract for Construction (as modified).

ARTICLE 5 - PAYMENTS

Based upon applications for payment submitted to the Engineer by the Contractor and certificates for payment issued by the Engineer, the City shall make monthly progress payments on account of the contract sum to the Contractor as provided in the conditions of the contract as follows:

The City will pay the Contractor, on or about the thirtieth calendar day after receipt of a Request for Payment, ninety-five percent (95%) of the portion of the contract sum properly allocable to labor, materials, and equipment incorporated in the Work and ninety-five percent (95%) of the portion of the contract sum properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing by the parties, less the aggregate of previous payments in each case; provided, however, that the owner, at any time after fifty percent (50%) of the Work has been completed, if it finds that satisfactory progress is being made, may make any of the remaining partial payments in full; and upon final completion, a sum sufficient to increase the total payment to one-hundred percent (100%) of the contract sum, less such retainage as the Engineer shall determine for all incomplete Work and unsettled claims. But such full payment or payments shall in no manner be construed as reducing the amount of the bond, or the liability of the surety thereon, until final completion and acceptance of all items of Work herein set forth.

The action of the Engineer by which the Contractor is to be bound according to the terms of this contract shall be that evidenced by his final estimate and certificate, all prior estimates upon which ninety-five percent (95%) or more may be made, being merely payment on account, and not payments for accepted Work, and subject to the correction of such final estimate, which may be made with notice to the Contractor.

ARTICLE 6 - CONTRACTOR'S REPRESENTATION

To induce the City to enter into this Contract, the Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local laws and regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site which have been provided with the Contract Documents, and (2) reports and drawings of a hazardous environmental condition, if any, at the site, which have been provided with the Contract Documents.

E. Contractor has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work.

F. Contractor is aware of the general nature of Work to be performed by City and others at the Site that relates to the Work as indicated in the Contract Documents.

G. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor

H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

I. Contractor hereby certifies that it has familiarized itself with Sections 33.1-86 through 33.1-93 of the Code of the City of Norfolk, Virginia, 1979, as amended, entitled "Ethics in Public Contracting," including the additional statutes set forth in Section 33.1-86 thereof, and further that all amounts received by the Contractor pursuant to this Agreement are proper and in accordance therewith.

J. Contractor hereby certifies that at all times during which any term of this Agreement is in effect, it does not and shall not knowingly employ any unauthorized alien. For purposes of this section, an "unauthorized alien" shall mean any alien who is neither lawfully admitted for permanent residence in the United States nor authorized to be employed by either Title 8, section 1324a of the United States Code or the U.S. Attorney General.

K. Contractor hereby represents that it is organized as a stock or non-stock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership and is authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 or as otherwise required by law.

ARTICLE 7 - CONTRACT DOCUMENTS

The Contract Documents consist of the following:

a. Invitation for Bids
b. Instructions to Bidders
c. Bid Form/Affidavit
d. Bid Bond
e. Contract
f. Performance Bond
g. Payment Bond
h. AIA A201-2007, "General Conditions of the Contract for Construction" (as modified)
i. Certificate of Insurance
j. Notice of Award
k. Notice to Proceed
l. Change Orders (if any)
m. Other Documents as may be required by law or appended hereto
n. Plans and Drawings prepared by: **Moseley Architects, 780 Lynnhaven Parkway, Suite 200, Virginia Beach, Virginia 23452.**
o. Specifications prepared or issued by: **Moseley Architects, 780 Lynnhaven Parkway, Suite 200, Virginia Beach, Virginia 23452.**
p. Addendum (as listed in Bid Form)

Witness the following signatures and seals:

(*Contractor)*

Witness: _____

By: _____
Written Signature

_____
Printed Signature

Seal
If
Incorporated

_____
Title *Date*

Virginia State Contractor's License No. _____

City of Norfolk Business License No. _____

Contents Approved:

_____
Director of Public Works

Approved as to form and correctness:

_____
Deputy City Attorney

CITY OF NORFOLK, VIRGINIA

By_____
City Manager

Attest:_____
City Clerk

Certification of Funds

I hereby certify that the money required for this contract (agreement, obligation or expenditure) is in the City Treasury to the credit of the fund from which it is to be drawn, and not appropriated for any other purpose.

Account: _____ Amount: _____

Contract No.: _____ Vendor Code: _____

_____
Director of Finance Date

End of Page

PERFORMANCE BOND

Bond No. _____
Amount: **$_____**

KNOW ALL PERSONS BY THESE PRESENTS, that **_____** of **_____** hereinafter called the Contractor and _____, a corporation duly organized and existing under and by virtue of the laws of the State of _____, hereinafter called the Surety, and authorized to transact business within the Commonwealth of Virginia as the Surety, are held and firmly bound unto the City of Norfolk as Owner, in the sum of **_____ Dollars and ____ Cents ($_____.__)**, lawful money of the United States of America, for payment of which, well and truly be made to the Owner, the Contractor and the Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the Contractor has executed and entered into a certain Contract, hereto attached, with the Owner dated _____, 2016 for

SCOPE COMPLEX IMPROVEMENTS – PHASE 1

NOW THEREFORE, if the Contractor, and its successors and assigns, shall at all times duly, promptly, and faithfully perform the Work and any alteration in or addition to the obligations of the Contractor arising thereunder, including the matter of infringement, if any, of patents or other proprietary rights, and shall assure all guarantees against defective workmanship and materials, including the guarantee period following final completion by the Contractor and final acceptance by the Owner and comply with all the covenants therein contained in the Specifications, Drawings, and other Contract Documents required to be performed by the Contractor, in the manner and within the times provided in the Agreement, and shall fully indemnify and save harmless the Owner from all costs and damage which it may suffer by reason or failure to do so, and shall fully reimburse and repay it all outlay and expenses which it may incur in making good any default, and reasonable counsel fees incurred in the prosecution of or defense of any action arising out of or in connection with any such default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that the Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the Work to be performed thereunder, or payment thereunder before the time required therein, or waiver of any provision thereof, or assignment, subletting or transfer thereof or any part thereof, shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, addition to the terms of the Contract Documents or any such payment, waiver, assignment, subcontract or transfer.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

Whenever Contractor shall be declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the Owner shall have the right, at its option, to require the Surety to promptly proceed to remedy the default within 30 days of notice by proceeding or procuring others to proceed with completing the Agreement with its terms and conditions including the correction of any defective work and the provision of safety measures required as the result of such default; and all reserves, deferred payments, and other funds provided by the Agreement to be paid to Contractor shall be paid to Surety at the same times and under the same conditions as by the terms of that Agreement such fund would have been paid to Contractor had the Agreement been performed by Contractor; and Surety shall be entitled to such funds in preference to any assignee of Principal of any adverse claimant. Notwithstanding the above, the Owner shall have the right, with the approval of the Surety which shall

not be unreasonably withheld, to take over and assume completion of the Agreement and be promptly paid in cash by the Surety for the cost of such completion less the balance of the Contract price.

IN WITNESS WHEREOF, all above parties bounded together have executed this instrument this _____ day of _____, **2016**, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

(_____)

By:_____(Seal)

Printed Name:_____

Title: _____

_____
Attest

SURETY

_____

By:_____(Seal)

_____
Attest

APPROVED AS TO FORM: _____, 2016

City of Norfolk, OWNER

By: _____
Deputy City Attorney

NOTE: Date of Bond shall not be prior to the date of the Agreement. If the Contractor is a partnership, all partners shall execute the Bond.

IMPORTANT: The Surety named on this Bond shall be one who is licensed to conduct business in the Commonwealth of Virginia, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent shall be accompanied by a certified copy of the authority to act for the Surety at the time of signing of this Bond.

End of Page

PAYMENT BOND

Bond No._____
Amount: **$_____**

KNOW ALL PERSONS BY THESE PRESENTS, that **_____** of **_____,** hereinafter called the Contractor and _____, a corporation duly organized and existing under and by virtue of the laws of the State _____, hereinafter called the Surety, and authorized to transact business within the Commonwealth of Virginia as the Surety, are held and firmly bound unto the City of Norfolk as Owner, in the sum of **_____ Dollars and ____ Cents ($_____.__),** lawful money of the United States of America, for payment of which, well and truly be made to the Owner, the Contractor and the Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the Contractor has executed and entered into a certain Agreement, hereto attached, with the Owner dated _____, 2016 for

SCOPE COMPLEX IMPROVEMENTS – PHASE 1

NOW THEREFORE, if the Contractor shall promptly make payments to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in the Agreement, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, repairs on machinery, equipment, and tools consumed, used or rented in connection with the construction of the Work, and all insurance premiums on the Work, and for all labor performed in the Work, whether by Subcontractor or otherwise, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the Work to be performed thereunder, shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract Documents.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, all above parties bounded together have executed this instrument this ____ day of _____, **2016**, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

(_____)

By:_____(Seal)

Printed Name:_____

_____
Attest

Title: _____

SURETY

_____

By: _____(Seal)

_____
Attest

APPROVED AS TO FORM: _____, 2016

City of Norfolk, OWNER

By: _____
Deputy City Attorney

NOTE: Date of Bond shall not be prior to the date of the Agreement. If the Contractor is a partnership, all partners shall execute the Bond.

IMPORTANT: The Surety named on this Bond shall be one who is licensed to conduct business in the Commonwealth of Virginia, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent shall be accompanied by a certified copy of the authority to act for the Surety at the time of signing of this Bond.

End of Page

AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)
Scope Complex Improvements - Phase 1

THE CITY OF NORFOLK, a municipal corporation of the Commonwealth of Virginia, hereinafter called the "City" or the OWNER:
(Name, legal status and address)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

THE ARCHITECT:
(Name, legal status and address)

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User Notes: (829323118)

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them ~~as being necessary to produce the indicated results.~~ or from prevailing custom or trade usage as being required to produce the intended result whether or not specifically called for at no additional cost to the Owner.

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§ 1.2.1.1 Should any conflict be found in the Contract Documents, the Architect/Engineer shall interpret or construe the Contract Documents so as to secure the most substantial and complete performance of the Work. In other words, the better quality or great quantity of work shall be provided in accordance with the Architect/Engineer's interpretation. The Architect/Engineer's decision in this matter shall be final.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 Wherever in the Contract Documents the words "as approved", "as directed", "as required", "acceptable", "satisfactory" and words of like import are used with references to the Work or its performance, and without further qualification, it shall mean as approved, as directed, as required by the Architect/Engineer and acceptable, satisfactory, etc. to the Architect/Engineer.

§ 1.2.5 The general character of the detailed work is shown on the Drawings, but minor modifications may be made on the shop drawings or mock-ups. Any details shall be worked out in relation to their location and their connection to other parts of the Work. Where on any drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out also apply to all other like portions of the Work. Where details or conditions are indicated but started only, such details or conditions shall be continued throughout the courses or parts in which they occur and shall also apply to all other similar parts in the Work unless otherwise indicated or specifically noted.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

Wherever the term "Architect" appears in this Agreement, it shall mean either Architect or Engineer.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The drawings, specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the drawings, specifications and other documents prepared by the Architect or the Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors and owners of ~~their respective Instruments of Service, including the Drawings and Specifications,~~ them, and will retain all common law, statutory and other reserved rights, ~~including copyrights. The Contractor,~~ in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The drawings, specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. As such, the City is hereby declared sole-owner of these documents in regards to this Project and will abide by the limitations described in Subparagraph 1.5.1. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers ~~shall not own or claim a copyright in the Instruments of Service.~~ are authorized to use and reproduce applicable portions of the drawings, specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the drawings, specifications and other documents prepared by

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the Architect and the Architect's consultants.. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

~~§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.~~

§ 1.5.2. Intentionally Omitted.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

~~§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~

§ 2.2.1. Intentionally Omitted.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise specified, the following applies:

a. Water line taps, construction of pits for water taps and meter, and restoration of the area to its original condition shall be performed by the Contractor at its expense. Only new water meters shall be installed by City forces at the expense of project sponsor (i.e. the City or private developer). All the aforementioned shall be coordinated by the Contractor.

b. Sanitary taps and cleanouts shall be done by the Contractor or its Subcontractor at the Contractor's expense. HRSD tap fees will be paid by the Owner.

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c. For gas and electrical work and associated meter installations, the Contractor shall be responsible for complete coordination of work with utilities, including provision of all necessary labor, equipment, and materials as required in the Contract Documents as well as payment of all resulting costs to aforesaid Work.

d. For telephone and cables, the Contractor shall be responsible for coordination of telephone trunk lines and cable installation with telephone/television company to the "point of penetration" to the facility, including provision of all necessary labor, equipment, and materials as required in the Contract Documents as well as payment of resulting costs to all aforesaid work.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the ~~Owner~~ Owner, subject to Subparagraph 3.74, but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.3.1 The Contractor shall be responsible for protecting pins, stakes, marks, hubs, and control points. Replacement of damaged or destroyed pins, stakes, marks, hubs or control points shall be conducted under the supervision of a surveyor licensed in the Commonwealth of Virginia, if required by the City, and at the Contractor's expense. The Contractor shall coordinate with the Survey Division of the Department of Public Works (664-4645) prior to resetting of points and shall provide certified documentation to include the reference/recovery sheet with swing ties for new benchmarks.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one ~~copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.~~(1) CD containing the drawings, specifications, and addendums, in PDF format, free of charge..

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or ~~failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect.~~ failure.. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

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§ **3.1.2** The Contractor shall perform the Work in accordance with the Contract Documents.

§ **3.1.3** The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ **3.2.1** Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ **3.2.2** Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. Any failure by the Contractor to acquaint himself with such information shall not relieve him from the responsibility for successfully performing the Work.

.1 Dimensions of Work shall not be determined by scale or rule, but figured dimensions shall be used at all times.

.2 The Contractor shall verify all dimensions by measurement at the jobsite, and shall take any and all other measurements necessary to verify the drawings and to properly layout the Work.

.3 The study of the Contract Documents by the Contractor shall be made sufficiently in advance of the actual layout of the work so as to allow the Contract Documents to be interpreted or modified by the Architect.

§ **3.2.3** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ **3.2.4** If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect ~~issues~~ in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. ~~If the Contractor performs those obligations, the Contractor~~ The Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, or for differences between field measurements or conditions and the Contract ~~Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.~~Documents unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect..

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ **3.3.1** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means,

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methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

a. **Substituted Materials.** Request for approval of any substituted material and equipment for those specified or shown on the drawings shall be made in writing to the Engineer within 30 days after award of the Contract. If this request is not submitted, the Engineer reserves the right to have the Contractor furnish the material and equipment definitely specified or shown on the plans. The Contractor shall show, in writing, the monetary savings, improvement in quality, time savings, and other factors to be gained from the proposed substitute. Approval of substitute materials and equipment will be at the sole discretion of the Engineer.

b. **Or Equal.** It is not the intent of these specifications to exclude or omit products or any responsible manufacturer, if said products are equal in every respect to those mentioned herein. Whenever an article, or any class of materials is specified by trade name or byname of any particular patentee, manufacturer or dealer, it shall be taken as intending to mean equal thereto in quality, finish, size, durability and equally as serviceable for the purpose for which it is or they intended. Request for approval of any "equal" material or product for those specified or shown on the drawings shall be made in writing to the Engineer within 30 days after award of the Contract. If this request is not submitted, the Engineer reserves the right to have the Contractor furnish the material and products definitely specified and shown on the plans. The Contractor shall show, in writing, that the material or product being proposed is equal in every respect to that specified and shall provide all necessary supporting documentation requested by the Engineer. The quality shall be determined by the Engineer, and he alone shall be sole judge as to what materials or services will be accepted as equal. No substitution of materials, methods or services specified shall be made without written approval from the Engineer.

c. **Materials and Equipment Manufacturer's Recommendation.** All materials, equipment or other items specified by trade or manufacturer's name shall be handled, installed, erected or connected in strict conformity with the manufacturer's recommendations and/or specifications. By making requests for substitutions, the Contractor:

1. Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;

2. Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;

3. Certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs and time extensions related to the substitution which may subsequently become apparent; and

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4. Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall be advised that there is NO permit fee for new construction, additions, etc. for CITY-OWNED BUILDINGS. Before final payment is made on the Project, Contractor shall demonstrate that the necessary inspections, certificates of occupancy, clearance, and/or acceptance from the City, State, Federal, and/or private entities/organizations such as from the City's Building Official, Corps of Engineers, Department of Environmental Quality, etc. have been obtained.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 **Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are ~~disturbed and in no event later than 21 days after first observance of the conditions.~~ disturbed, Contractor shall not disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so "except in an emergency as required by Paragraph 10.4.. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. With respect to unforeseen Work that is paid on a Unit Price Basis, any adjustment in quantity and Contract price will be determined by the Architect/Engineer subject to the provisions of Subparagraph 15.1.5.3. Architect/Engineer will review with the Contractor the Architect/Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or

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otherwise). If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.4.1 Possible Price and Times Adjustments. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Terms if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner in respect to Contract price and Contract times by the submission of a Bid or becoming bound under a negotiated contract; or

b. The existence of such condition could reasonably have been discovered or revealed as a result of examination, investigation, exploration, test, or study of the Site and contiguous areas required by the bidding requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give written notice within the time and as required by Subparagraph 3.7.4.

§ 3.7.4.2 Subsurface and Physical Conditions. The Contract Documents identify:

a. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that the Architect/Engineer has used in preparing the Contract Documents.

b. Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that the Architect/Engineer has used in preparing the Contract Documents.

§ 3.7.4.3 Limited Reliance by Contractor on Technical Data Authorized. Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data", if any, shall be identified in Supplementary General Conditions. Contractor may not rely upon or make any claim against Owner, Architect/Engineer, or any of the Architect/Engineer's consultants with respect to:

a. The completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by the Contractor, and safety precautions and programs incident thereto; or

b. Any Contractor interpretation of or conclusion drawing from any "technical data" or any such data, interpretations, opinions, or information.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

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.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2. The Contractor shall attach with monthly invoices the original copy of sales invoices/receipts for materials or equipment that are covered under allowances.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner ~~with reasonable promptness.~~in sufficient time to avoid delay in the Work.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

1. The superintendent shall not be changed except with the consent of the Owner, unless the superintendent ceases to be in the Contractor's employ.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, and prior to mobilization or proceeding with any work on site, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.9.4 A qualified General Superintendent shall be present on the project site whenever work is being performed, unless otherwise authorized in writing by the Owner. The Contractor shall notify the Owner whenever the superintendent will be absent for four hours or more. This notification shall include the name of the designated substitute. Any substitute shall be familiar with the project and have the same authority of the primary superintendent. Verbal notification is acceptable for periods less than one full workday.

1. The qualified General Superintendent shall remain on site each day throughout all work days whenever contract work is performed through the punch list period **and until all punch list items are complete.** Lack of supervision shall constitute a reduction in the Contract Amount of General Conditions, Supervision, or other category which solely represents at the General Contractor's work responsibility, in the amount of $250.00 per day, or any portion of a day, based on the amount indicated.

§ 3.9.5 The superintendent shall serve as a day to day point of contact on the Project for the Owner and shall, as a minimum, have the authority to:

a. Act on behalf of the Contractor;

b. Direct the work of Subcontractors;

c. Respond to directed changes in the schedule;

d. Provide detailed updates to and respond to inquiries from the Owner on the progress of the work;

e. Act upon verbal and written notification of non-conforming work;

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f. Respond to any complaints regarding the conduct or actions of any employee of the Contractor or any Subcontractor.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. At the Pre-Construction Conference, the Contractor shall submit to the Engineer for its timely review a preliminary construction schedule indicating the times (number of days or dates) for starting and completing the various stages of the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

1. The progress schedule shall be in the form of a bar graph and shall identify each major or critical activity. The progress schedule shall be updated monthly. Five (5) copies of the updated progress schedule shall be submitted with each Application for Payment.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

1. Reproduction of the Contract Drawings, or any portion thereof, shall not be acceptable.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal

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schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

The Contractor, within **15 days from the Notice to Proceed,** shall submit to the Engineer for approval, a complete schedule of submittals for shop drawings and technical and/or engineering data sheets covering all items and equipment for this Contract as listed in each respective division. Submit for approval **six (6) copies of certified Shop Drawings and technical data sheets** plus sufficient copies for Contractor's use. Approval of the above submissions shall not relieve the Contractor from complying with the drawings and specifications, nor shall such approval be construed as a guarantee of the accuracy of dimensions or other covered items. The Engineer shall endeavor to process all drawings, data sheets, etc., within 21 calendar days of receipt unless impractical. Except for construction schedule and schedule of values that need to be turned over directly to the City for review/approval, the Contractor shall forward all other submittals for review/approval to only one clearing house. The City will notify the Contractor during the Pre-Construction Conference where to send these submittals.

1. Unless otherwise directed or specified, samples shall be submitted in duplicate. Samples shall be properly labeled, bearing the name and quality of material, name of the manufacturer, name of Project, name of the Contractor and the date of submission.

§ **3.12.6** By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, ~~or will do so~~ and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. All copies of Shop Drawings submitted for approval shall bear the following statement: "Checked and certified correct for conformance with Contract Documents." This statement shall be dated and signed by the Contractor and shall appear on each submittal. One copy of each approved submittal shall be kept at job site at all times.

§ **3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

1. The Contractor shall furnish to the field as many prints of the approved Shop Drawings as may be required.

§ **3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ **3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ **3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear

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such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.14.3 UNDERGROUND UTILITY DAMAGE PREVENTION ACT

The Contractor shall be required and agrees to comply with all the provisions of the Virginia Underground Utility Damage Prevention Act (Section 56-265.14, *et seq.* Code of Virginia, 1950, as amended) and hereby agrees to hold the City of Norfolk harmless against any loss, damages or claims of any nature whatsoever arising out of the Contractor's failure to comply with the requirements of said Act.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project. In addition, immediately after the completion of the Work, or any portion thereof, the Contractor shall restore the facility, street, and surrounding area to a condition as clean as before the Work was begun. The drainage system shall also be inspected and cleaned by the Contractor. If done by the City or its agents, any expense the City may incur will be charged against the Contractor and deducted before Final Payment is made. The Contractor will be required to back fill along the edges of the sidewalks, driveways and curbs where settlement has occurred, and reshape and reslope where directed. Site must be maintained regularly according to State and City regulations, including regular grass cutting. During the progress of the Work, the sidewalks and portions of the streets adjoining the Work, or in its vicinity, must not be obstructed or littered, and the adjacent sidewalks and gutters must be kept clean as directed by the Engineer.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and ~~Owner shall be entitled to reimbursement from~~ the costs thereof shall be charged to the Contractor.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but

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shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity ~~that~~ which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.1.1 The requirements of this Paragraph 3.18 shall be incorporated into the Contractor's insurance policies in a manner approved by the Owner.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The ~~Owner shall retain an architect~~ architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture ~~in the jurisdiction where the Project is located. That person or entity is identified as the Architect~~ identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

~~**§ 4.1.3** If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.~~

§ 4.1.3. Intentionally Omitted.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 As the Owner's Project representative, the Consulting Architect/Engineer's duties, responsibilities and limitations of authority shall be presented during the Pre-Construction Conference. The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.1.1 Engineer – An individual or entity having an Agreement with the Owner to furnish services as Owner's independent professional consultant with respect to the Project and who is identified as such in the Agreement.

§ 4.2.2 The ~~Architect~~ Architect, as a representative of the Owner, will visit the site at intervals appropriate to the stage of ~~construction, or as otherwise agreed with the Owner, to become generally familiar with the~~ the Contractor's

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operations (1) to become familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, and ~~to determine in general if the Work observed is being performed in a manner indicating that~~ (2) to endeavor to guard the Owner against defects and deficiencies in the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will ~~not~~ neither have control over, charge of, ~~or responsibility~~ nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and

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assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

§ 4.2.15 PRE-CONSTRUCTION CONFERENCE. Before starting the Work, the Architect/Engineer/Owner will schedule a conference to review the requirements on such matters as Project supervision and on-site inspection, Shop Drawing schedules and submission, progress schedules and reports, payrolls, payments to contractors, contract change orders, insurance, safety, labor provisions and equal opportunity in employment and any other items pertinent to the Project. Present at the conference will be the Architect/Engineer, Owner, Project Representative, the Contractor, and it's Superintendent for the project.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, ~~as soon as practicable~~ within 15 days after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for ~~each principal portion of~~ the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

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§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable ~~objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.~~objection..

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or ~~Architect~~ Architect, upon written notice of such intent, makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

~~When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.~~.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

~~§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.~~

§ 5.4.3. Intentionally Omitted.

§ 5.5 SUBCONTRACTORS COORDINATION OF WORK

Every subcontractor performing work that affects others shall provide for all requirements of the other trades, notwithstanding the Contractor's responsibility to coordinate the Work. Should the work provided by unsuitable for the application of work by any other subcontractor, the subcontractor shall notify the Contractor and the Engineer in writing immediately. The Contractor is required to forward a copy of correspondence from his subcontractors providing notice of unsuitable work.

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ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of ~~subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.~~ subrogation..

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

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ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement ~~among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or~~ between the Owner and Contractor; a Construction Change Directive may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.1.4 Modifications shall be in compliance with the Code of the City of Norfolk, Virginia, Chapter 33.1.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 ~~Unit prices stated in the Contract Documents or subsequently agreed upon;~~Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Architect/Engineer's recommendation to the City as follows:

Architect/Engineer will review with Contractor the Architect/Engineer's preliminary determinations on such matters before rendering a written recommendation thereon (by endorsement of an Application for Payment or otherwise). City's written decision thereon (by approval of Application for Payment or otherwise) will be final and binding (except as modified by Architect/Engineer to reflect changed factual conditions or more accurate data) upon Contractor, subject to the provisions of Paragraph 7.3.4.

Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

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.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably ~~adjusted.~~adjusted provided that there is no corresponding adjustment with respect to any other item of Work.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 ~~Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and~~Overhead and profit costs, except where such costs have been determined by means of Paragraph 7.3.3.2 above, wherein such costs are included in the unit prices, shall be determined as follows:;

Fifteen percent (15%) of the costs determined above shall be paid for overhead and profit of the Contractor or subcontractor(s) actually performing the work, including, but not limited to, field and home office expense, superintendent, taxes, subsistence expenses of any nature, premiums on bonds, insurance, and all other costs and expenses as determined by the City.

In the event the work is performed by a subcontractor or subcontractors, the Contractor shall be paid ten percent (10%) of the total costs determined above, excluding the subcontractor's or subcontractors' overhead and profit, to cover and compensate the Contractor for its overhead and profit;

.5 ~~Additional costs of supervision and field office personnel directly attributable to the change.~~. Intentionally Omitted.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the ~~Architect.~~ Architect plus overhead and profit to actual net cost.. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

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§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may not request payment for Work completed under the Construction Change Directive in Applications for Payment. The ~~Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.~~ Contractor may only include the amounts of fully executed Change Orders in the Applications for Payment.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the ~~Owner pending mediation and arbitration;~~ Owner; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

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ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

Based upon Applications for Payment submitted to the Engineer by the Contractor and certificates for payment issued by the Engineer, the City shall make monthly progress payments on account of the Contract Sum to the Contractor as provided in these General Conditions of the Contract for Construction as follows:

The City will endeavor to pay the Contractor, on or about the thirtieth (30th) calendar day after receipt of Request for Payment, ninety-five (95%) percent of the portion of the Contract Sum properly allocated to labor, materials and equipment incorporated in the work and ninety-five (95%) percent of the portion of the Contract Sum properly allocated to materials and equipment suitably stored at the site or at some other location agreed upon in writing by the parties, less the aggregate of previous payments in each case; provided however, the City, at any time after fifty (50%) percent of the work has been completed, if it finds that satisfactory progress is being made, may in its sole discretion make any of the remaining partial payments in full. Also, upon Substantial Completion of the work, the City may increase total payment to one hundred (100%) percent of the Contract sum, less such retainage as the Engineer shall determine for incomplete work and unsettled claims. But such full payment or payments shall in no manner be construed as reducing the amount of the bond or the liability of the Surety thereon, until Final Completion and acceptance of all lines of work herein set forth. Final Payment shall be made upon completion of all work and acceptance by the Engineer in accordance with the General Conditions.

The action of the Engineer by which the Contractor is to be bound according to the terms of this Contract shall be evidenced by his final estimate and certificate, all prior estimates upon which ninety-five (95%) percent or more may be made, being merely payments on account, and not payments for accepted work, and subject to the corrections of such final estimate, which may be made without notice to the Contractor thereof, or of the measurements upon which the same is based.

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be ~~notarized, if required,~~ certified by an officer of the firm and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may not include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, ~~or by interim determinations of the Architect,~~ but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such

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materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a separate contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.
- .8 failure to comply with obligations under the Contract.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld. The City reserves the right to determine payment made.

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§ **9.5.3** If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ **9.6.1** After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ **9.6.2** The Contractor ~~shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.~~is obligated to take one of the two following actions within seven (7) days after receipt of amounts paid to the Contractor by the Owner for work performed by any subcontractor under this Agreement:

a. Pay the subcontractor for the proportionate share of the total payment received from the Owner attributable to the work performed by the subcontractor under this Agreement; or

b. Notify the Owner and the subcontractor, in writing, of the Contractor's intention to withhold all or a part of the subcontractor's payment with the reason for nonpayment.

The Contractor is obligated to pay interest to the subcontractor on all amounts owed by the Contractor to the subcontractor that remain unpaid after seven (7) days following receipt by the Contractor of payment from the Owner for work performed by the subcontractor under this Agreement. Unless otherwise provided under the terms of this Agreement, interest shall accrue at the rate of one percent (1%) per month.

The Contractor shall include in each of its subcontracts, if any are permitted, a provision requiring each subcontractor to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier subcontractor.

The Contractor's obligation to pay an interest charge to a subcontractor pursuant to this section may not be construed to be an obligation of the City. A contract modification or Amendment to the Agreement may not be made for the purpose of providing reimbursement for such interest charge. A cost reimbursement claim may not include any amount for reimbursement for such interest charge.

§ **9.6.3** ~~The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.~~A Subcontractor inquiry for progress payment and other information shall be directed to the City Attorney's office under the Freedom of Information Act..

§ **9.6.4** The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ **9.6.5** Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ **9.6.6** A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ **9.6.7** Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by

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the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

~~If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.~~. Intentionally Omitted.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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§ **9.9.2** Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ **9.9.3** Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ **9.10.1** Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ **9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. The Contractor shall submit a Contractor's release from liens, claims, security interests or encumbrances along with final invoice. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ **9.10.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ **9.10.4** The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents; or
- **.3** terms of special warranties required by the Contract Documents.

§ **9.10.5** Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

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ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall provide temporary fences, barricades, coverings, or other protection to preserve existing items indicated to remain and to prevent injury or damage to persons or property.

This includes providing protection of the Work, materials, appliances and fixtures against weather, rain, wind, storms, freezing or heat. At the end of the day's work, work likely to be damaged shall be properly protected. For work on existing buildings, the Contractor shall accomplish the work in such a manner that the remainder of the building, and its contents and inhabitants, are fully protected from any weather damage.

The Contractor shall be responsible for ensuring that adequate measures are taken to secure materials and equipment during the progress of the Work to prevent storm-related hazards. It is, therefore, essential that the Contractor take necessary precautions to ensure that openings in the building are monitored carefully. The Contractor shall take immediate actions required to seal of such openings when rain or other detrimental weather is imminent, and at the end of each workday; and ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

The provisions of this subparagraph take precedence over any similar provisions contained in the technical specifications.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

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§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the ~~Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection.~~ Owner.. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written ~~agreement of the Owner~~ direction by the City and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

~~**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.~~

§ 10.3.3. Intentionally Omitted.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the ~~site unless such materials or substances are required by the Contract Documents.~~ site. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

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§ 10.4 EMERGENCIES
In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

§ 10.4.1 EMERGENCY CONDITIONS. The issuance of a Declaration of Emergency conditions by any authorized government official may result in the suspension of the Work under the Contract and/or the ordering by the City of additional work. The Contractor shall make available to the City, during the time of the declared emergency, labor and equipment for such services under the terms and conditions of the Contract. Labor and equipment rates shall not exceed FEMA reimbursable rates for the Hampton Roads area. Failure to comply with such emergency directives may result in termination of the Contract by reason of non-compliance.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

See Subparagraphs 3.18.1 and 10.3.1

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 Claims for damages insured by usual personal injury liability coverage;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 ~~The insurance required by Section 11.1.1 shall be written for not less than limits of liability~~ All liability policies shall be written in an occurrence form unless otherwise specifically approved by the City.

The Contractor shall secure and maintain in force insurance, including malicious mischief and vandalism, with minimum acceptable amounts described below, naming the City as additional insured during the life of the Contract:

.1	Worker's Compensation	Statutory
	Employer's Liability	$200,000 per accident injury
.2	Commercial General Liability	Combined single limit $3,000,000 or
		$2,000,000 per occurrence
		$3,000,000 aggregate
		$3,000,000 products & completed
		Operations

The Commercial General Liability Insurance required above shall include the following extensions of coverage:

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(1) The coverage shall be provided under a Comprehensive form of policy or similar thereto.
(2) X.C.U. Coverage – If the Contract requires any work procedures involving blasting, excavating, tunneling or other underground work, the liability coverage shall include Standard Blasting or Explosion Coverage, Standard Collapse Coverage and Standard Underground Coverage, commonly referred to as XCU liability coverage with limits of $500,000 per occurrence and $1,000,000 aggregate.
(3) Broad Form Property Damage Endorsement.
(4) Contractual Liability coverage shall be included.
(5) Protective Liability coverage shall be included to protect the Contractor against claims arising out of operations performed by its Subcontractors.
(6) Products Liability and/or Completed Operations coverage shall be included.

.3 Comprehensive Automobile Liability including owned, non-owned and hired vehicles:

Combined Single limit each accident	$2,000,000
Bodily Injured	$1,000,000 per person
	$2,000,000 per occurrence
	$2,000,000 aggregate
Property Damage	$500,000 per occurrence

.4 Environmental Impairment Liability Insurance. If applicable, as determined by the City, the Contractor shall procure and maintain during the life of the Contract Environmental Impairment Liability Insurance, which shall protect against all claims and costs including, but not limited to, bodily injury or property damage claims (including clean-up costs) caused by pollution conditions, as herein defined, arising from the contracted work. Pollution conditions means the discharge, dispersal, release or escape of smoke vapor, soot, fumes, acids, alkalis, toxic chemicals, liquids, gases, waste materials or other irritants, contaminants, or pollutants into or upon land, the atmosphere or any watercourse or body of water, which results in bodily injury or property damage. The policy limits will be determined by the City and specified in the Contract Documents or ~~required by law, whichever coverage is greater. Coverages, whether written on an occurrence or~~ as prescribed by City, State or Federal law/regulations. Coverages, written on a claims-made basis, shall be maintained without interruption from the date of commencement of the Work until at least one year following the date of final payment and ~~termination of any coverage required to be maintained after final payment, and,~~ with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 All insurance policies required hereunder shall contain an express provision therein, or endorsement attached thereto, worded substantially as follows:

"This is not to be cancelled or become subject to reduction of coverage prior to thirty days after the insured has received written notice mailed to the address noted hereinbefore, as evidenced by return receipt of registered letter."

All insurance certificates and/or policies shall designate the City of Norfolk, its employees, and its agents as "additional insured" regarding the contracted Work.

Certificates of Insurance issued by companies licensed within the Commonwealth of Virginia shall provide the designed insurance.

Contractor shall notify the City in writing within 10 days after receiving notice of any cancellation or reduction in coverage.

Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies

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will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 ~~The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.~~**SUBCONTRACTOR'S INSURANCE.** The Contractor shall require all subcontractors to secure and maintain in force containing the same coverage and amounts as described in Subparagraph 11.1.2.

§ 11.2 OWNER'S LIABILITY INSURANCE

~~The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.~~. Intentionally Omitted.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 ~~Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.~~Until the work is completed and accepted by the City, the Contractor shall purchase and maintain a Builder's Risk or property insurance as is appropriate upon the entire work at the Site to the full insurable value thereof.

~~**§ 11.3.1.1** Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.~~

~~**§ 11.3.1.2** If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.~~

~~**§ 11.3.1.3** If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.~~

~~**§ 11.3.1.4** This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.~~

~~**§ 11.3.1.5** Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or~~

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~~companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.~~

§ 11.3.1.1. Intentionally Omitted.

§ 11.3.1.2. Intentionally Omitted.

§ 11.3.1.3. Intentionally Omitted.

§ 11.3.1.4. Intentionally Omitted.

§ 11.3.1.5. Intentionally Omitted.

§ 11.3.2 BOILER AND MACHINERY INSURANCE

~~The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.~~. Intentionally Omitted.

§ 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

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§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished. A Performance Bond and Payment Bond Rider is required for all Change Orders that are in the amount of $100,000 or greater; or, if the aggregate total of multiple Change Orders is equal to or greater than $100,000.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties

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established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

~~**§ 12.2.2.3** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.~~

§ 12.2.2.3. Intentionally Omitted.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

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§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

~~Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~ Intentionally Omitted.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law,

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but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

~~§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:~~

~~.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;~~

~~.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;~~

~~.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or~~

~~.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.~~

~~§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.~~

~~§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.~~

~~§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.~~

§ 14.1.1: Intentionally Omitted

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.4 .

§ 14.1.2. Intentionally Omitted.

§ 14.1.3. Intentionally Omitted

§ 14.1.4. Intentionally Omitted

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

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§ 14.2.2 When any of the above reasons exist, the Owner, ~~upon certification by the Initial Decision Maker that sufficient cause exists to justify such action,~~ , may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not ~~executed.~~executed and costs incurred from this termination.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

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§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Decision of Owner. Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial ~~decision.~~ evaluation and recommendation. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, ~~an initial decision~~ a final decision by the Owner shall be required as a condition precedent to ~~mediation of any Claim~~ litigation of all Claims between the Contractor and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the ~~Initial Decision Maker~~ Architect with no decision having been ~~rendered.~~ rendered by the Owner. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not ~~decide~~ evaluate disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The ~~Initial Decision Maker~~ Architect will review Claims and within ten days of the receipt of ~~a~~ the Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) ~~reject~~ recommend rejection of the Claim in whole or in part, (3) ~~approve~~ recommend approval of the Claim, (4) ~~suggest~~ recommend a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to

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evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will ~~either reject or approve~~ recommend either rejection or approval of the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will ~~render an initial decision~~ recommend approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The ~~initial~~ Owner's decision shall be final and binding ~~on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.~~subject to mediation or arbitration.

~~**§ 15.2.6** Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.~~

~~**§ 15.2.6.1** Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.~~

§ 15.2.6. Intentionally Omitted

§ 15.2.6.1.. Intentionally Omitted.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION

~~**§ 15.3.1** Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.~~

~~**§ 15.3.2** The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.~~

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~~§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.~~

§ 15.3.1. Intentionally Omitted.

§ 15.3.2... Intentionally Omitted.

§ 15.3.3... Intentionally Omitted.

§ 15.4 ARBITRATION

~~§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.~~

~~§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.~~

~~§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.~~

~~§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.~~

§ 15.4.1... Intentionally Omitted.

§ 15.4.1.1.. Intentionally Omitted.

§ 15.4.2. Intentionally Omitted.

§ 15.4.3. Intentionally Omitted.

§ 15.4.4 CONSOLIDATION OR JOINDER

~~§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).~~

~~§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.~~

§ 15.4.4.1. Intentionally Omitted.

§ 15.4.4.2.. Intentionally Omitted.

§ 15.4.4.3. Intentionally Omitted.

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PART II

1. SCHEDULES AND REPORTS

Contractor shall submit for approval the following items in four (4) copies prior to commencing the Work:

a. A complete, detailed construction progress schedule in weekly increments, showing anticipated start and completion of all sections of the Work. Also, see sections 3.10 and 3.10.1

b. A complete list of Subcontractors

c. A breakdown of the Project contract price for use in processing monthly requisitions.

d. A projection of contract's monthly cash flow requirements for the duration of the Project.

e. The above requirements may be waived for small projects at the discretion of the Engineer.

2. MINORITY PARTICIPATION

The Contractor shall notify the City in writing of the names of any minority and disadvantaged business subcontractors to be used on the Project, including the estimated dollar amount of such subcontract and the minority classification of such subcontractors. A minority and disadvantaged business is one that is at least 51% owned by an Asian American, Black, Hispanic, and American Indian, Eskimo, Aleut, or Female.

3. EROSION & SEDIMENT CONTROL

On construction projects that are required by the City's Erosion & Sediment Control ordinance (City Code Chapter 15) to have an approved erosion and sediment control plan, the Contractor shall be required to implement the approved plan and comply with all conditions of the plan. A copy of the approved plan and the Virginia Erosion and Sediment Control Handbook. (Third Edition, 1992) shall be kept at the City. If the Contractor determines that the approved plan cannot be effectively carried out, the Contractor shall be responsible for notifying the plan approving authority and requesting a plan amendment as provided for in the Virginia Erosion and Sediment Control Law (Code of Virginia Title 10.1, Chapter 5, Article 4, Section 10.1-563C).

4. RIGHT TO AUDIT

For cost-reimbursement contracts, change orders issued for fixed priced contracts or other contracts in excess of $30,000, which include the provisions of services, the Contractor shall retain all books, records and other documents relative to this Contract for five (5) years after final payment or until audited by the Office of the City Auditors shall have full access to and the right to examine and duplicate any of said materials during said period.

~~§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.~~

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(829323118)

PREBID QUESTION FORM

Only questions requiring a modification or interpretation to the Bidding Documents by an addition, deletion, clarification, or correction, will be made by written Addendum, and made available on the Owner's website, www.norfolk.gov/bids.aspx . It is the responsibility of the Bidder to check the site for Addendums as they will not be sent directly to the Bidder.

The Architect and Owner shall not be responsible for oral modifications and interpretations. Bidders and Sub-bidders requesting a modification or interpretation by addition, deletion, clarification, or correction of the Bidding Documents shall complete and submit this form which shall reach the Architect no later than seven (7) calendar days prior to the date scheduled for receipt of bids. Use a separate form for each question submitted.

DATE: _____

PROJECT: NORFOLK SCOPE COMPLEX IMPROVEMENTS – PHASE 1

MOSELEY ARCHITECTS PROJECT NUMBER: 521650

The following question concerns Drawing (number)_____:

_____

_____

_____

_____

_____

_____

The following question concerns Specifications Section (number) _____, page _____, paragraph _____:

_____

_____

_____

_____

_____

_____

Questions submitted by: _____

Name Organization

E-mail PDF version of Form to: pramirez@moseleyarchitects.com

I. HAZARDOUS MATERIAL STUDIES

A. Hazardous material studies are available separately from the Owner and are not part of the Contract Documents.

B. The opinions expressed in the hazardous material studies are those of the testing firm and represent its interpretation of the existing conditions, tests, and the results of analyses that it has conducted. The accuracy or completeness of the data is not warranted or guaranteed by the Owner or the Architect, and in no event are they to be considered part of the Contract Documents. The Owner and Architect expressly disclaim any responsibility for the data as being representative of the conditions and materials that may be encountered.

C. Should the data contained in the hazardous material studies not be adequate for the Contractor's and/or Bidder's purposes, he/she may make, prior to bidding, his/her own explorations, tests and analyses.

D. Hazardous materials will be removed by the Owner before start of the Work.

E. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

II. RECORD DRAWINGS

A. Record drawings of the original design are available separately from the Owner and are not part of the Contract Documents. Drawings covering renovations and alterations made after the original design do not exist. Original design record drawings are available in electronic pdf format only and may not be to scale.

B. The accuracy or completeness of the original design record drawings are not warranted or guaranteed by the Owner or the Architect, and in no event are they to be considered part of the Contract Documents. The Owner and Architect expressly disclaim any responsibility for the original design record drawings as being representative of the actual conditions and materials that may be encountered.

END OF SECTION

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END OF SCHEDULE OF DRAWINGS

SECTION 011000 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

B. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased (sequenced) construction.
4. Work by Owner.
5. Work under separate contracts.
6. Future work.
7. Owner-furnished products.
8. Access to site.
9. Coordination with occupants.
10. Work restrictions.
11. Miscellaneous provisions.

C. Related Requirements:

1. Section 015000 “Temporary Facilities and Controls” for limitations and procedures governing temporary use of Owner's facilities.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Norfolk Scope/Chrysler Hall Complex Improvements, Phase 1, City of Norfolk, Virginia, Department of Public Works Contract Number 13343B.

1. Project Location: 201 E. Brambleton Ave, Norfolk, Virginia 23510.

B. Owner: City of Norfolk.

1. Owner's Representative: Robert T. Jackson, City of Norfolk Public Works Design Division, 810 Union Street, Suite 700, Norfolk, Virginia 23510.
2. Owner’s Existing Building Complex Representative(s): (To be determined), Seven Venues (City of Norfolk, Department of Cultural Fine Arts and Entertainment) Scope Arena, 201 E. Brambleton Ave, Norfolk, Virginia 23510.

C. Architect: Moseley Architects of Virginia Beach, Virginia.

D. The Work consists of the following:

1. The existing building (Norfolk Scope Arena) was designed by Peir Luigi Nervi and completed in 1971 and is in need of expansion to meet the current functional and programmatic needs. The Work includes an approximate 4,000 GSF 1 story, addition to the existing Scope Arena and is the first phase of a multi-phase renovation plan to be implemented over time. There may be futures phases beyond Phase II and are also not-in-contract. The existing Arena is on an elevated plinth (podium) plaza, and there is no civil or underground utility work. The existing site is primarily a large scale gathering and entertainment complex consisting of several existing buildings and structures (Scope Arena, Exhibition Hall, Plaza , Chrysler Hall, and Parking Garage). It is located in a downtown urban area bordered by heavily traffic primary roads and sidewalks. Phase II is not-in-contract and is a future west addition work. Phase 1 consists of an expansion of the existing East concourse into the plaza. Expansion includes restroom spaces (1,675 GSF), concession space (725 GSF), and additional concourse and concession queuing space (1,350 GSF). Concession space will be orientated to allow queing parallel to existing circulation space. The existing facility has a major deficiency in the women's restroom fixtures and this Phase 1 addition will provide the first step toward bringing the facility up to current code and provide patrons who frequent Norfolk Scope a much needed amenity. Additional exits at the existing curtain wall are to be provided, in order remove existing exits in the way of the addition. The existing outdoor smoking areas shall be relocated since it is also in the way of the addition. Phase 1 also includes Bid Alternates to renovate the existing public restrooms (both level concourses), meeting rooms and exhibition lobby, which totals approximately 15,780 GSF. All Work shall not conflict with the occupancy, egress and operations of the Scope Arena, Concourse, Toilets, Exhibition Hall, Plaza, ramps, Chrysler Hall and parking garage, especially during any Owner Events (including related operations before and after the public portion of the Event). The Work shall be sequenced to not conflict with Owner Events that occur throughout the calendar year. The Work shall be sequenced so no loss of existing total exits or restrooms during occupancy. The addition primary finishes include a sloped glazing system (majority of the envelope), outdoor precast concrete perimeter knee wall, metal wall panels (indoor and outdoor), indoor wall tiling and terrazzo flooring. The visual aesthetics of the addition, is to complement the existing exposed structural concrete shell dome and buttress geometries with a monolithic but visually transparent form and not necessarily match all the existing finishes.

E. Use of Professional Seals on Bidding, Procurement, and Contract Documents: For the purposes of this paragraph, the term "Regulant" refers to the individual who signs and seals parts of the Contract Documents (e.g. the Drawings and Specifications). Certain information has been excerpted verbatim from a source or sources (e.g., UL Assemblies, SMACNA details, IBC code text) which was considered or used by Regulant in preparing parts of the Contract Documents, as follows:

1. The excerpted information was neither prepared under the direct control nor personal supervision nor created by the Regulant, as it was prepared by the source and owner of the excerpted information.
2. For purposes of bidding, procuring, and performance of the Work, and in any Event of conflicts or ambiguities between the excerpted information in the Contract Documents and the requirements of applicable codes and standards, provide the better quality or greater quantity of Work which, at a minimum, complies with the requirements of the applicable codes and standards.

3. Advise Architect immediately upon becoming aware of requirements of the Work which are not consistent with the requirements of the excerpted information.
4. Attribution is acknowledged for information obtained and included herein verbatim from other source or sources.
5. Regulant has taken into consideration and used certain excerpted information from other sources which are applicable to the Contract Documents, and the Regulant indicates by its seal that it is assuming responsibility for its services in use and application of the excerpted information to the requirements of Work, but not for the excerpted information itself which was prepared by others. Regulant does not indicate by its seal that it is responsible for use or application of other information in such source or sources which was not included herein.

1.4 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.5 PHASED CONSTRUCTION (SEQUENCING)

A. The Work conducted under Phase 1, shall require multiple sequencing in order to avoid loss of any existing toilet rooms (i.e. plumbing fixtures, lighting) and exits (i.e. doors, halls, ramps, lighting, etc) while the existing building is occupied (i.e. Concourse, Lower Concourse, and Exhibition Hall). An Event shall require Owner occupancy. The Work shall not conflict with any Event. Provide temporary ADA ramp for each Event, when the existing ramp (at the Exhibition Hall Lobby) cannot be used (as a means of accessible exiting and entry for the Exhibition Hall and Lobby). Refer to the Architectural Sequencing Drawings.

B. **If Bid Alternates No.1, 2, 3, & 4 are <u>not</u> included,** the Work shall start no later than **March 1, 2016 (Tuesday)** with the Final Completion Date shall be no later than **July 31, 2017 (Monday)** and Substantial Completion date shall be **June 1, 2017 (Thursday).**There is a total of **518** calendar days from start to final completion, unless noted otherwise. This total reduces per paragraph regarding Work Restrictions.

C. **If Bid Alternates No.1, 2, 3, & 4 are included,** the Work shall start no later than **March 1, 2016 (Tuesday)** with a Final Completion Date no later than **November 30, 2017 (Thursday)** Substantial Completion shall be **October, 31, 2017.** There is a total of **640** calendar days from start to final completion, unless noted otherwise. This total reduces per paragraph regarding Work Restrictions.

D. The Work shall be conducted per the following sequences to accommodate the Life Safety Design and Owner's operational requirements:
   1. **Sequence #1**:
      a. Relocate existing outdoor smoking area located at gate 3 to gate 10. Shall include fencing, gates, patching waterproofing and pavers complete. Shall not conflict with occupied Events and reduce exiting.
   2. **Sequence #2**:
      a. Erect primary temporary partitions, barriers, protection and adjust to suit various sequencing of work. Maintain protected egress and exit paths at all times building is occupied. Maintain access to elevators at all times building is occupied. Maintain utilities serving occupied areas. Where necessary, provide

temporary utility bypasses if duration of work conflicts with schedule of occupied areas.

3. **Sequence #3**:
   a. Maintain existing number of inspected and approved exits available for each level during all occupied Events. Complete all locations of retrofit door exits, which includes grating, rails, exit signage and patching. Retrofit locations are gates 5, 6, 9 and 10.
4. **Sequence #4**:
   a. After retrofit doors are completed and approved for occupancy, exit existing doors at gate 3 area, can be removed. If necessary due to adjacent work, temporarily close the existing exit doors along gate 5. Temporary loss of no more than 4 exit doors is acceptable at gate 5, due to extra doors.
5. **Sequence #5**:
   a. During Event occupancy of the exhibition hall or lobby, maintain ramp, exit doors, fire alarms, lighting, and protected egress paths. Work could occur during specified summer schedules (limited Events). If substantial completion of work is in conflict with Event schedule occupancy requirements, provide temporary ADA compliant ramp.
   b. Includes Bid Alternate No. 2, if included in the Work.
   c. Includes Bid Alternate No. 4, if included in the Work.
   d. Temporary Occupancy. During each Event, provide temporary controls and access for the exhibition hall lobby if still under demolition & construction and not yet completed.
6. **Sequence #6**:
   a. Start and complete for occupancy, the lower concourse toilet room renovations, during specified summer schedules (limited Events).
   b. Includes Bid Alternate No. 1, if included in the Work.
   c. Temporary Occupancy. During each Event, provide temporary controls and access for each toilet room if still under demolition & construction and not yet completed.
   d. Shall be no total net loss of any existing toilet and lavatory fixtures for any Event.
   e. Provide temporary portable toilets and lavatories for each Event if there is a net loss of existing toilet and lavatory fixtures.
7. **Sequence #7**:
   a. Start and complete for occupancy, the concourse toilet room renovations, during specified summer schedule (limited Events). After addition toilet rooms are completed and occupiable, sequence work on existing toilet rooms so that no total net loss of any existing toilet and lavatory fixtures for any Event. All toilets shall be fully operational for the duration of the Event.
   b. Includes Bid Alternate No. 3, if included in the Work.
   c. Temporary Occupancy. During each Event, provide temporary controls and access for each existing toilet room if still under demolition & construction and not yet completed.
   d. Provide temporary portable toilets and lavatories for each Event if there is a net loss of existing toilet and lavatory fixtures.

8. The remaining Work shall be substantially complete and ready for occupancy at time of Substantial Completion for the Work.

E. Temporary Occupancy. When an Event requires temporary occupancy and access of a room or space and if the Work is not complete (i.e. existing toilets/ restrooms and exhibition hall lobby), provide temporary controls. Shall primarily provide and maintain the code required fire, life safety and ADA requirements. Shall provide functional room.

1. Maintain existing fully operational and unblocked automatic sprinkler; alternatively provide Fire Watch for each Event.
2. Maintain fully operational fire alarms, unobstructed from view and sound.
3. Maintain existing or equivalent lighting including emergency lighting.
4. If demolition and construction work create a rough and uneven floor, whereas the levelness exceeds ¼" high, provide temporary plywood flooring. It shall be secure to avoid potential tripping and sliding. Shall not project more than ¼" thick and allow ADA accessibility.
5. Maintain fully operational toilets, lavatories, sinks, urinals with no temporary overall loss of plumbing fixtures per the Work.
   a. If necessary, remove and reinstall plumbing fixtures prior to each Event.
6. Maintain existing toilet compartment partitions.
   a. If necessary, remove and reinstall prior to each Event.
7. Maintain existing handicapped compartments including grab bars.
   a. If necessary, remove and reinstall prior to each Event.
8. Maintain existing toilet room accessories
   a. If necessary, remove and reinstall prior to each Event.
9. Maintain existing heating and ventilation.
10. Any exposed ceilings, shall secure any loose items from falling and out of reach.
11. Any rough walls with jagged or sharp edges shall have temporary gypsum board secured to existing walls.
12. Any loose tools, apparatus, materials storage, shall not be kept in same room or space.
13. At the exhibition hall lobby, provide ADA temporary ramp.
    a. If necessary, remove and reinstall prior to each Event.
14. Temporary occupancy controls shall require advance approval and inspection by the local authorities having jurisdiction for each Event it is to be used.

F. Warranties shall start upon final completion, and not per any Owner temporary occupancy of any room or space not fully completed. If necessary, provide extend warranties to cover Owner temporary occupancies.

G. Before commencing Work of each sequence, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates for all sequences of the Work.

H. Refer to Work Restriction Paragraph 1.13 and Summer Schedules below when no Work is allowed due to Events.

I. **Summer Schedules:** Owner typically has very few Events during a continuous 3 to 4 month period each summer. Contractor should utilize this time frame to sequence certain parts of the

critical Work in order to avoid conflicts with Events. **From approximately late May thru late September 2016 and again in 2017, during those same months,** the Scope Arena, Toilets, Concourses, Ramps (indoor and outdoor), Exhibition Hall and outdoor Plaza may have each up to **a total of** approximately **15 Work Restricted days for each summer, for bidding purposes.**

1. Each Summer Schedule Work Restricted days **are** included within the overall total Work Restricted days and are **not** in addition to that total.
2. An allowance or contingency for future potential Events are included in the total.
   a. There is the possibility, that not all of the total work restricted days will be required for the summer schedule or some will instead require partial day work restrictions.
   b. The home ice-hockey team may require additional home playoff games.
   c. Some rain day site Events occur, however Owner will not know if cancelled at least 24 hours in advance of the Event occurrence.
3. Additional Events will be added or revised in the future, especially the second half of 2016 and all of 2017, however for bidding purposes, provide per the total Work Restricted days.
4. Owner shall be allowed to relocate any work restricted days or hours not used during each Summer Schedule to elsewhere in the Work Calendar.
5. Owner shall be allowed to convert equally any restricted normal business days not used, to Partial Day Hours and vice-versa.
6. Events shall require access and use of fully operational existing toilet rooms with no loss of any existing plumbing fixtures.
7. When Events occur at the Exhibition Hall, the Exhibition Lobby shall maintain existing access and exits, including ADA compliant ramps. Provide temporary ADA ramp if the existing ramp is not available.
8. A very small number of Events occur at the Chrysler Hall, but would be evening or weekend hours (typically after working hours).
9. Refer to Sequence #5 for work to occur during the **2016** and/or 2017 Summer Schedules.
10. Refer to Sequence #6 for work to start and complete during the **2016** Summer Schedule.
11. Refer to Sequence #7 for work to start and complete during the **2017** Summer Schedule.

1.6 FUTURE WORK

A. The Contract Documents include requirements that will allow Owner to carry out future work following completion of this Project; provide for the following future Work:
   1. Phase II, West Building Addition
   2. Future Work is Not In Contract.

1.7 ALTERNATE ITEMS

A. Definition: An Alternate Item (also known as Bid Alternate) is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each Alternate Item is the net addition to or deduction from the Contract Sum to incorporate Alternate Item into the Work. No other adjustments are made to the Contract Sum.
2. **Provide total sum cost of Alternates No.1, 2, 3 & 4 on Bid Form.**

B. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the Alternate Item into Project.
1. Include as part of each Alternate Item, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of the Alternate Item.

C. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each Alternate Item. Indicate if Alternate Items have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to Alternate Items.

D. Execute accepted Alternate Items under the same conditions as other work of the Contract.

E. **SCHEDULE OF BID ALTERNATES**
1. **Alternate No. 1:** Renovate Lower Concourse Men and Women Toilets.
   a. 1 men's room and 1 women's room.
   b. Approximately +/- 950 GSF
2. **Alternate No. 2:** Renovate Exhibition Hall Lobby.
   a. Approximately +/- 4,020 GSF
3. **Alternate No. 3:** Renovate Concourse Men and Women Toilets.
   a. 4 women's rooms and 3 men's rooms.
   b. Approximately +/- 3,970 GSF
4. **Alternate No. 4:** Renovate Meeting Rooms 1, 2, 3, & 4.
   a. Approximately +/- 6,840 GSF

F. Additional information & requirements:
1. Refer to each corresponding Work Schedule (i.e. Completion Dates, etc) above under paragraph 1.5 PHASED CONSTRUCTION (SEQUENCING).
2. **Bid Alternate No. 2:** Provide a portable temporary ramp (including landings, handrails and modular to suit per drawings) if the existing ramp is not accessible for each Event. Shall fully comply with ADA (2009 ICC/ANSI A117.1). Shall require inspection by the local authority having jurisdiction.
3. **Bid Alternates No. 1 and 3:** Refer to following paragraph on Bidder/Contractor Options.

1.8 BIDDER/CONTRACTOR OPTIONS

1. Refer to Div 1 - "Temporary Facility and Controls" for paragraphs on Bidder/Contractor Options.
   a. There shall be no net loss of existing toilets and hand washing fixtures during Events, per 1.5 PHASED CONSTRUCTION (SEQUENCING). Provide portable temporary facilities when the Work causes a net loss of existing toilets and hand washing fixtures for any Event.

1.9 WORK UNDER OTHER CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

B. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

C. Preceding and/or Concurrent Work: Owner will perform the following construction operations at Project site. Those operations are scheduled to be substantially complete before work under this Contract begins.

1. Asbestos Inspection and Removal

D. Preceding and/or Concurrent Work: Owner will self perform separate the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract Concurrent Work:

1. Removal and reinstallation of existing Food Service Equipment at bar and kiosks.
2. Removal and reinstallation of loose furniture and loose equipment, unless noted otherwise
3. Removal of toilet room disposables.
4. Existing curtain wall sealing and repair, except at building addition.
5. Existing grating.

E. Preceding and/or Concurrent Work: Owner may award separate contract(s) for the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract.

1. Retrieve and store salvage existing exterior curtain wall glazing and doors.

F. Future Work: Owner may award separate contract(s) for the following additional work to be performed at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory work under this Contract.

1. Telephone Service Contract: A separate contract will be awarded to provide telephone service connection from the existing facility.
2. Data Service Contract: A separate contract will be awarded to provide data service from the existing facility.

G. Preceding and/or Concurrent Work and/or Future Work: Owner may award separate contract(s) for the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract. Owner may award separate contract(s) for the following additional work to be performed at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory work under this Contract.

1. Concession Equipment Contract: A separate contract may be awarded to provide concessions equipment for the facility.

1.10 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated as Owner-furnished, Contractor-installed (OFCI). The Work includes providing support systems to receive Owner's equipment.

1. Owner will arrange for and deliver Shop Drawings, Product Data, and Samples to Contractor.
2. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.
3. After delivery, Owner will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
4. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
5. Owner will arrange for manufacturer's field services and for delivery of manufacturer's warranties to Contractor.
6. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.
7. Contractor shall review Shop Drawings, Product Data, and Samples and return them to Architect noting discrepancies or anticipated problems in use of product.
8. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
9. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
10. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.
11. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.

B. Owner-Furnished Products:

1. Toilet Paper Dispensers
2. Paper Towel Dispensers
3. Soap Dispensers
4. Toilet Seat Cover Dispensers

1.11 USE OF PREMISES

A. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings by the Contract limits.

B. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner occupancy of Project site and use by the public.
2. Driveways and Entrances: Keep driveways, parking garage, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
   a. Schedule deliveries to minimize use of driveways and entrances.

b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Clean all construction vehicles and motorized equipment on site so dirt and mud are not carried onto Owner's roads, parking lots, parking garage, and off-site public roadways.

D. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

1. Do **not** use any of the existing elevators.
2. Do **not** use any of the existing toilets for worker personnel use.

1.12 OWNER'S OCCUPANCY REQUIREMENTS

A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits, unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than **14** notice to Owner of activities that will affect Owner's operations.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.13 WORK RESTRICTIONS

A. **On-Site Work Hours:** Work shall be generally performed inside the existing building and site during **normal business working hours of 6:00 a.m. to 3:00 p.m**., **Monday through Friday**, except as otherwise indicated. **Shall not conflict with any Event.** An Event shall require Owner occupancy and egress.

1. Weekend Hours: When no Event is scheduled and as approved in writing by the Owner.
2. Early Morning Hours: When no Event is scheduled and as approved in writing by the Owner.

3. Hours for Utility Shutdowns: When no Event is scheduled and as approved in writing by the Owner.
4. Hours for Core Drilling and Other Noisy Work: When no Event is scheduled and as approved in writing by the Owner.
5. Evening Hours: When no Event is scheduled and as approved in writing by the Owner.
6. Partial Day Hours: Where no Event is scheduled, except later in the day, and as approved in writing by the Owner.

B. **For bidding purposes,** there shall be an **overall gross total of 80 normal business working days, no Work is allowed,** due to Events.

1. The total includes an allowance for the possibility of added Events in the future.
2. Owner shall be allowed to relocate any work restricted days or hours not used to elsewhere in the Work Calendar.
3. Owner shall be allowed to convert equally any restricted normal business days not used, to Partial Day Hours and vice-versa.

C. **Events:** An Event shall require Owner occupancy and access. It can also include the set up before (load-in) and disassembly after (load-out) the public portion of the Event.

1. Coordinate in advance and frequently with Owner to avoid any conflict with Events.
2. Owner has a calendar of events on their website, however, not all Events are listed and could change; therefore for **bidding purposes use the total number of restricted working days.**
3. Booked events cannot change, per any request**,** however Events booked could cancel (i.e. rain site Events**).**
   a. For indicated rain site locations, typically 24 hours in advance of the Event, can be determined if used or canceled.
4. Owner typically can confirm booked Event dates approximately 6 months in advance of the Event occurrence.
5. Owner typically can confirm related operation locations, durations and any unique noise requirements, approximately once an Event is confirmed/booked or by 1 month prior to the Event occurrence(s).
6. For certain annual Events, Owner is familiar with unique requirements based upon previous operations and occupancy of the Event.
7. The Owner's assigned Events Coordinator will provide to the Owner, Contractor and Architect, an electronic spreadsheet calendar of all Events. Owner and Architect can provide to the awarded bidder upon request, but not during the bidding process.
   a. This document shall be maintained and updated by the Owner's Events Coordinator.
   b. Shall indicate if Event is confirmed, tentative (hold), etc or if any other information.
   c. Shall indicate if no work is allowed during normal or partial working days, weekends or other special hours.
   d. Shall indicate name of Event and spaces to use.

e. Shall indicate any Event operations of any unique criteria, such as noise, security, etc.

f. This document shall require frequent coordination due to future updates or changes, especially for second half of 2016 and 2017 events yet to be booked.

1) Calendar cannot indicate dates for possible future Events until approximately 6 months in advance of the Event occurrence. Shall maintain any spare restricted normal work day events as much as possible.

g. Shall require bi-monthly meetings with Owner (and Architect if necessary) to re-verify and coordinate.

1) Discuss any high priority and schedule sensitive Work activities.

a) Discuss and confirm each summer schedule or any other critical schedule(s).

2) Discuss any Work activities and Events, where each corresponding schedule could change and how to account for such contingencies.

3) Discuss and confirm each Event requirements versus the Work requirements.

4) Discuss and confirm if any after normal working hours is required.

5) Discuss and confirm if due to the type of Work, an exception is required for certain work that will not conflict with the Event.

6) Document the number of restricted normal work days and hours not used, used and scheduled to use. Indicate and track per each month.

7) Discuss any other relevant information.

D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than **14** days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Owner's written permission.

E. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify **Owner** not less than **14** days in advance of proposed disruptive operations.

2. Obtain **Owner's** written permission before proceeding with disruptive operations.

F. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (**8** m) of entrances, operable windows, or outdoor-air intakes.

G. Controlled Substances: Use of tobacco products and other controlled substances within the existing building is not permitted.

H. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

1.14 GENERAL REQUIREMENTS:

A. It is required that the Contractor and all Subcontractors carefully phase the work to permit orderly flow of vehicular traffic during construction.

B. Construction site access, isolation of construction operations, safety measures, and other issues will be coordinated and clarified at Pre-construction conference as outlined in the Contract Documents.

C. Provide security measures to protect the existing building during the entire contract period. Any damage to the existing buildings due to lack of security shall be repaired or replaced by the General Contractor to the satisfaction of the Owner and at no additional cost to the Owner. No increase in the completion time(s) will be allowed for any security-related problems.

D. Coordinate and schedule security measures with the Owner.

E. The Owner's interior building toilet facilities shall **not** be available to construction personnel. Contractor to provide own toilet facilities.

F. Do **not** use existing elevators.

G. Parking and Temporary Road Closures: The Owner does **not** have free available parking. There may be available parking onsite in the existing 2-story underground parking garage. There are various City Owned parking spaces off site, such as the Harbor Park Baseball Stadium that could be available. There shall be **no** work personnel parking on the podium (plaza). Contractor shall contact the Department of Public Works Right-of-Way Division, and purchase any necessary parking permits and/or temporary road closures. Coordinate with Owner in advance, in order to not conflict with Owner Events and operations. Coordinate with Owner in advance, for any temporary road closures since all roads are heavily used.

1. Department of Public Works Right-of-Way Division

   810 Union St.
   Second Floor
   Norfolk, VA 23510
   Ph: 757-664-7306

H. Coordinate with Owner in advance to access the existing ramps and loading dock area. This provides vehicular loading access to the Lower Concourse Work areas, via the Exhibition Hall.

I. After hours and week-end work shall be coordinated in advance with the Owner, especially to not conflict with each Event operations.

J. Verify all existing grades, lines, levels, and horizontal and vertical dimensions, prior to commencing construction operations. Report any errors or inconsistencies to the Architect BEFORE beginning any work on this project.

K. Provide Pest Control, per 015000 Temporary Facilities and Control. Coordinate with Owner and A/E.

1.15 PATCH AND REPAIRING:

A. Replace all existing concrete walks, curbs, gutters, paving, and topsoil and seed where such is not indicated to be disturbed, where disturbed by construction work, to the satisfaction of the Owner.

B. Replace all existing plaza pavers, sand bedding, waterproofing, drains, concrete stairs and ramps where such is not indicated to be disturbed, where disturbed by construction work, to the satisfaction of the Owner.

1.16 DRAWINGS AND SPECIFICATIONS

A. Provide all indicated or required equipment and materials with all features normally provided with items, although all features of design and construction may not be indicated in complete details. Include all standard features and appurtenances normally provided and/or required for safe operation.

B. The Contractor shall be responsible for including all items and parts of the Work, as defined by requirements of the Contract Documents. Unless the Contract Documents specifically designate an item of part of the Work that is to be provided by a Subcontractor, then it is the sole responsibility of the Contractor to determine and allocate/assign the performance of each item or part of the Work. The Contractor shall not be entitled to any compensation or adjustment of time or to any other Claim due to any provision of the Contract Documents which assigns or allocates, or fails to assign or allocate, the performance of any item or part of the Work to any specific Subcontractor of Contractor. In no Event shall the Contractor be entitled to request an interpretation or decision by, or any determination or instruction from, the Architect concerning or about any assignment or allocation of parts of the Work. The Architect will not be responsible to arbitrate or otherwise resolve any dispute or differences about such allocation or assignment between Contractor and any Subcontractors.

C. "Summary" and "Related Sections" provisions in the Specifications, if any are stated or referred to in any Specification, are provided only for general reference and for convenience, and do not limit or alter in any way the requirements for the provision of the Work in the Contract Documents. Items or parts of the Work, and related provisions of the Contract Documents, even though not listed or stated in any Summary or Related Section provision, but which are indicated elsewhere in the Contract Documents, shall be included in the Work. Even though a Summary or Related Section may not refer to, state, or list each and every part of the Contract Documents which may include provisions about a specific item or part of the Work, all of the other applicable provisions of the Contract Documents remain in full force and effect, and shall be included in determining the requirements for the Work.

1.17 CLEANING AND PROTECTION:

A. General:

1. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
2. Supervise construction activities to ensure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
3. Retain stored items in orderly arrangement allowing maximum access, not impeding traffic or drainage.
4. Do not allow accumulation of scrap, debris, waste material, other items not required for construction of this work.
5. At least twice each month, and more often if necessary, completely removes all scrap, debris, and waste material from the job site.
6. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Structures:

1. Weekly, and more often if necessary, inspect each structure and pick up all scrap, debris, and waste material. Remove such items to place designated for their storage.
2. Weekly, and more often if necessary, sweep interior spaces clean.
3. As required preparatory to installation of succeeding materials, clean structures or pertinent portions thereof to degree of cleanliness recommended by manufacturer of succeeding material, using equipment and materials required to achieve necessary cleanliness.
4. Once finish work begins, the cleaning process will be on a daily basis (and more often if necessary) at all times while finish work is being performed. "Clean", "Cleaning" shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.

PART 2 - PRODUCTS

2.1 Refer to Bid Alternates.

PART 3 - EXECUTION

3.1 Refer to Bid Alternates.

END OF SECTION 011000

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and Contract Documents apply to this Section.

B. Comply per 3.4.1 thru 3.3.3 Labor and Materials, under A201 General Conditions of the Contract for Construction As Modified. The following, shall not supercede the General Conditions.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 SUBMITTALS

A. Substitution Requests: Contractor shall request and submit a “Substitution Request Form – After Receipt of Bids” for all substitutions to be considered after receipt of bids.

1. Substitution Request Form: Use the Architect’s form, which can be obtained from the Architect at the time of the request.
   a. The form is an electronic Word document requiring the Contractor to fill in “data fields.”
   b. A copy of the form is attached to the end of this Section for informational purposes only. Use the electronic Word document only.
2. No substitutions will be considered unless submitted using the referenced “Substitution Request Form – After Receipt of Bids.”
3. All substitutions must be submitted by the Contractor, and shall include the Contractor’s certification and signature.
   a. Substitution requests submitted directly from subcontractors, sub-subcontractors, manufacturers, vendors, installer, and suppliers will be rejected.
4. Failure to submit the form, or a fully completed form, shall result in the rejection of the proposed substitution; and shall also include:
   a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will be necessary to accommodate proposed substitution.

b. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

c. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

d. Samples, where applicable or requested.

e. Certificates and qualification data, where applicable or requested.

f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

h. Research reports evidencing compliance with building code in effect for Project.

i. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

j. Cost information, including a proposal of change, if any, in the Contract Sum.

k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

5. If the proposed substitution is found to be acceptable to the Architect, the request will be forwarded to the Owner for their approval.

6. If the Owner approves the substitution, it will then be included in a Change Order.

7. Only substitutions included in Change Orders shall be allowed to be included in the Work

8. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will advise the Owner on acceptability.

   a. Forms of Acceptance: Change Order only.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 21 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when all of the following conditions are satisfied. If all of the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.

b. Substitution request is fully documented and properly submitted.

c. Requested substitution will not adversely affect Contractor's construction schedule.

d. Requested substitution has received necessary approvals of authorities having jurisdiction.

e. Requested substitution is compatible with other portions of the Work.

f. Requested substitution has been coordinated with other portions of the Work.

g. Requested substitution provides specified warranty.

h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received within **30** days after Award of Construction Contract. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when all of the following conditions are satisfied. If all of the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume.

1) Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

b. Requested substitution does not require extensive revisions to the Contract Documents.

c. Requested substitution is consistent with the Contract Documents and will produce indicated results.

d. Substitution request is fully documented and properly submitted.

e. Requested substitution will not adversely affect Contractor's construction schedule.

f. Requested substitution has received necessary approvals of authorities having jurisdiction.

g. Requested substitution is compatible with other portions of the Work.

h. Requested substitution has been coordinated with other portions of the Work.

i. Requested substitution provides specified warranty.

j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

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Substitution Request Form – After receipt of Bids

All Substitution Requests shall be submitted by the Contractor only. Substitution Requests received from subcontractors, sub-subcontractors, manufacturers, vendors, etc., will be "rejected" without review.

General Information	
Project Name	NORFOLK SCOPE COMPLEX IMPROVEMENTS - PHASE 1
A/E Project Number	521650

Specified Product/Item Information	
Specification Title	
Section	
Page	
Article / Paragraph	
Description	

Proposed Substitution Information				
Proposed Substitution				
Reason for not providing specified product/item				
Comparative Data	Attach a point-by-point comparative data list. Include all differences between the proposed substitution and the specified product/item. If not provided, this Request will be rejected.			
Manufacturer				
Manufacturer Address				
Manufacturer Phone				
Manufacturer Representative Email address				
Trade / Model Name				
Model Number				
Installer				
Installer Address				
Installer Phone				
History	☐ New product	☐ 2-5 years	☐ 5-10 yrs	☐ 10 yrs or longer
Proposed substitution affects other parts of the Work	☐ Yes		☐ No	
If yes, explain				
Savings to Owner for accepting proposed substitution	$			
Proposed substitution affects Contract Time	☐ Yes		☐ No	

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If yes	☐ Add	☐ Deduct
If yes, number of calendar days		
Proposed Substitution Similar Installation		
Have you (this Contractor) used this product/item on any other projects	☐ Yes	☐ No
Project		
Project Address		
Architect/Engineer		
A/E Phone		
Owner		
Owner Phone		
Date installed		

Attached Supporting Data					
☐ Drawings	☐ Product Data/Specs	☐ Samples	☐ Tests	☐ Reports	☐

Contractor certifies all of the following:
• Contractor shall provide specified product/item in the event this Substitution request is rejected. • Proposed substitution has been fully investigated and determined to be equal or superior in all respects to the specified product, except as may otherwise be specifically and clearly indicated herein. • If applicable, proposed substitution shall not adversely affect LEED requirements nor shall it prevent achieving the relative number of applicable LEED point[s] the specified product would have received. • Proposed substitution's function, appearance, and quality are equal or superior in all respects to the specified product, except as may otherwise be specifically and clearly indicated herein. • Same or superior warranty and/or guarantees shall be furnished for proposed substitution as is required for the specified product/item. • Same maintenance service and source replacement parts, as applicable, are available; including local availability. • Proposed substitution shall have no adverse effect on other trades. • Cost data as stated herein is complete. Claims for additional costs related to the accepted proposed substitution which may subsequently become apparent shall be waived; including licenses, fees, and/or royalties. • Proposed substitution shall not affect dimensions and functional clearances. If the proposed substitution does affect dimensions and/or functional clearances, Contractor shall adjust the Work as required and necessary to accommodate the proposed substitution at no additional cost to the Contract. • Payment shall be made by the Contractor, via a deduct/credit Change Order, for changes to the building design, including A/E fees for the design and detailing, caused by the proposed substitution. • Coordination, installation, and changes to the Work as necessary for the accepted proposed substitution shall be complete in all respects.

Contractor Information	
Submitted by	
Signed By	
Date	
Email address of Signee above	
Company Name	
Address	
Phone	

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Architect / Engineer Review and Action	
Approval of this substitution request is an acceptance of only the manufacturer and product/item for general conformance with the design concept reflected in the Contract Documents. The A/E has made no attempt to verify specific performance data, or to check the details of the proposed substitution as to special features, capacities, physical dimensions, or code and/or regulatory compliance, all of which remain the responsibility of the Contractor.	
☐ Proposed Substitution approved for inclusion in Change Order, if approved by Owner – Provide submittals in accordance with Contract Document requirements.	
☐ Proposed Substitution approved as noted for inclusion in Change Order, if approved by Owner - Provide submittals in accordance with Contract Document requirements.	
☐ Proposed Substitution rejected – Provide specified product/item.	
☐ Proposed Substitution submittal/form not in accordance with Contract Documents (not timely, incomplete)	
Comments / Remarks	
Reviewed by	
Signed By	
Date	

END OF SUBSTITUTION REQUEST FORM

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

B. Comply per Article 7 Changes In The Work, under the A201 General Conditions of the Contract for Construction As Modified. Following shall not supercede the General Conditions.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Requirements:

1. Section 01250 “Substitution Procedures” for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on form provided by Architect.

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: **Architect** will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by **Architect** are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request or 14 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
   a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   c. Include costs of labor and supervision directly attributable to the change.
   d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
   e. Quotation Form: Use forms acceptable to Architect.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to **Architect**.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 “Substitution Procedures” if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, **Architect** will issue a Change Order for signatures of Owner and Contractor on form provided by Architect.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: **Architect** may issue a Construction Change Directive on form provided by Architect which instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

B. Comply per Article 9 Payments and Completion, under the A201 General Conditions of the Contract for Construction As Modified. Following shall not supercede the General Conditions.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections:

1. Division 01 Section “Construction Progress Documentation” for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
2. Division 01 Section “Submittal Procedures” for administrative requirements governing the preparation and submittal of the submittal schedule.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:
   a. Application for Payment forms with continuation sheets.
   b. Submittal schedule.
   c. Items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the schedule of values to Architect at earliest possible date but no later than ten days before the date scheduled for submittal of initial Applications for Payment.
3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values correlated with each element.

B. Format and Content: Use the Project Manual table of contents format (specification section numbers and names) to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:
   a. Project name and location.
   b. Name of Architect.

c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
   a. Related Specification Section or Division.
   b. Description of the Work.
   c. Name of subcontractor.
   d. Name of manufacturer or fabricator.
   e. Name of supplier.
   f. Change Orders (numbers) that affect value.
   g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
      1) Labor.
      2) Materials.
      3) Equipment.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of Contract Sum or as appropriate.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
8. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
   1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: Progress payments shall be submitted to Architect by the **TWENTY FIRST** of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

1. Submit draft copy of Application for Payment ten days prior to due date for review by Architect.

C. Application for Payment Forms: Use forms acceptable to **Architect** and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. **Architect** will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:
   a. Materials previously stored and included in previous Applications for Payment.
   b. Work completed for this Application utilizing previously stored materials.
   c. Additional materials stored with this Application.
   d. Total materials remaining stored, including materials with this Application.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to **Architect** by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

I. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
5. Products list (preliminary if not final).
6. Schedule of unit prices.
7. Submittal schedule (preliminary if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.
11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
12. Initial progress report.
13. Report of preconstruction conference.
14. Certificates of insurance and insurance policies.
15. Performance and payment bonds.
16. Data needed to acquire Owner's insurance.

J. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
   2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

K. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
   1. Evidence of completion of Project closeout requirements.
   2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
   3. Updated final statement, accounting for final changes to the Contract Sum.
   4. AIA Document G706, “Contractor's Affidavit of Payment of Debts and Claims.”
   5. AIA Document G707, “Consent of Surety to Final Payment.”
   6. Evidence that claims have been settled.
   7. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
   8. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.
4. Requests for Interpretation (RFIs).

1.3 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts

and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

1.5 SUBMITTALS

A. Above-Ceiling Pre-Construction Conference and Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

   a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.

   b. Indicate required installation sequences.

   c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

2. Sheet Size: At least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).

3. Number of Copies: Submit electronic PDF of each submittal. Architect will return one copy.

   a. Submit five copies and electronic PDF where Coordination Drawings are required for operation and maintenance manuals. Architect will retain a copy; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.

4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

B. Above-Ceiling Pre-Construction Conference: Schedule and conduct with all affected parties present to review procedures for addressing potential conflicts, review of Coordination Drawings (if furnished) and obtain approval of each affected trade to ensure components, materials, and systems can be installed as intended prior to the Work being performed.

1. Identify Above-Ceiling Pre-Construction Conference on the Construction Schedule as a “milestone” date.

2. Advise the Architect of potential conflicts identified in the Coordination Drawings (if furnished) and Above-Ceiling Pre-Construction Conference.
3. Do not proceed with construction or installation of the components, materials, and systems until potential conflicts identified have been resolved and affected parties have agreed to a remedy.

C. Remedies to address conflicts not identified in the Coordination Drawings (if furnished), Above-Ceiling Pre-Construction Conference, or otherwise addressed prior to construction or installation of the affected components, materials, and systems; or discovery of a non-workable situation without Coordination Drawings on file with the Owner will not be considered as a basis of delay, time extension, or additional cost to the Contract.

D. Key Personnel Names: Within **15** days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1.7 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: The Architect will prepare the meeting agenda and distribute it to all invited attendees.
3. Minutes: The Architect will record significant discussions and agreements achieved. Within 7 days of the meeting the Architect will distribute the meeting minutes to the Owner, the Architect, the Architect's Consultants, and to attending major subcontractors, manufacturers, suppliers and other concerned parties.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than **15** days after execution of the Contract Agreement. Hold the conference at Project site or another convenient location. The Architect shall conduct the meeting to review responsibilities and personnel assignments.
1. The following discussion topics shall be in addition to those listed in the General Conditions:

a. Parking availability.
b. Equipment deliveries and priorities.
c. Working hours.
d. Critical work sequencing and long-lead items.
e. Distribution of the Contract Documents.
f. Coordination and submittal of color and finish related selections.
g. Preparation of Record Documents.
h. Use of the premises and existing building.
i. Work restrictions.
j. Owner's occupancy requirements.
k. Responsibility for temporary facilities and controls.
l. Progress cleaning.
m. First Aid.
n. Security.
o. Phasing.
p. Critical work sequencing and long-lead items.
q. Preparation of Record Documents.
r. Office, work, and storage areas.

2. Minutes: Architect will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.

2. Agenda: Contractor will review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. The Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility problems.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written recommendations.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.

t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Contractor will record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: The Architect shall conduct progress meetings at bi-monthly intervals. Coordinate dates of meetings with preparation of payment requests; one of the monthly progress meetings shall be the Monthly Pay Meeting.

1. Attendees: Representatives of the Owner, the Architect and the Contractor shall be represented at each of these meetings. Design consultants, Subcontractors, suppliers, and other entities concerned with current progress or involved in planning, coordination, or performance of future activities may be invited to attend these meetings on an as needed basis to resolve specific issues. All participants at these meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      1) Review schedule for next period.
   b. Review present and future needs of each entity present, including the following:
      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site utilization.
      8) Temporary facilities and controls.
      9) Work hours.
      10) Hazards and risks.
      11) Progress cleaning.
      12) Quality and work standards.

13) Status of correction of deficient items.
14) Field observations.
15) RFIs.
16) Field Clarification. (FC)
17) Status of proposal requests.
18) Pending changes. (Potential Change Order – PCO)
19) Status of Change Orders. (CO)
20) Pending claims and disputes.
21) Documentation of information for payment requests.

3. Minutes: Architect will record and distribute meeting minutes.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

E. Coordination Meetings: Conduct Project coordination meetings at bi-monthly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

   a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

   b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

   c. Review present and future needs of each contractor present, including the following:

      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site utilization.

8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Change Orders.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.8 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
3. RFIs that would be clearly answered by simply reading the Contract Documents and that are not open to reasonable misinterpretation therefrom may be deemed "frivolous" by the Architect. The cost in time and materials to respond to frivolous RFI's shall be the responsibility of the Contractor.

B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
    a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:
   a. Requests for approval of submittals.
   b. Requests for approval of substitutions.
   c. Requests for coordination information already indicated in Contract Documents.
   d. Requests for adjustments in the Contract Time or the Contract Sum.
   e. Requests for interpretation of Architect's actions on submittals.
   f. Incomplete RFIs or RFIs with numerous errors.
2. Architect's action may include a request for additional information in an attempt to avoid requiring a full resubmittal. The Architect's time for response will be extended by the time it takes to receive the requested additional information."
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to conditions of the Contract.
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

D. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at intervals as established. Software log with not less than the following:
   1. Project name.
   2. Name and address of Contractor.
   3. Name and address of Architect.
   4. RFI number including RFIs that were dropped and not submitted.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date Architect's response was received.
   8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

B. The requirements of this section are in addition to, not in place of, those found in the General Conditions of the Contract.

C. Comply per 3.10, 3.12 and 8 of the A201 General Conditions of the Contract for Construction As Modified. Following shall not supercede the General Conditions.

1.2 SUBMITTALS (for information only; no action will be taken by the Architect)

A. Submittal Schedule: Submit four copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for each submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

B. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.

C. Daily Construction Reports: Submit two copies at monthly intervals.

D. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

E. Special Reports: Submit two copies at time of unusual event.

1.3 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Submittals Schedule, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTAL SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by Contractor's Construction Schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with Contractor's Construction Schedule.

a. At Contractor's option, show submittals on the Construction Schedule, instead of tabulating them separately.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. Procedures: Prepare precedence diagram network using AON (activity-on-node) format. Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, time-scaled CPM network analysis diagram for the Work.

1. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

C. Activities: Treat each story or separate area as a separate activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: As a predecessor to Substantial Completion include activities of reasonable duration for startup and testing of equipment. Schedule should include activities for individual / specific areas, <u>not</u> just one activity for entire project.
5. Building Commissioning and Testing: As a predecessor to Substantial Completion include a reasonable duration period for building commissioning and testing.
6. Substantial Completion: Indicate completion of work activities in advance of the date established for Substantial Completion, and include separate activities for Architect's administrative procedures necessary for certification of Substantial Completion.

D. CPM Schedule Preparation and Constraints: Prepare a list of all activities required to complete the Work. Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work by Others: Include a separate activity for each portion of the Work performed by Owner or other contractors necessary for the completion of the Work.

3. Owner-Furnished Products: Include a separate activity for each product. Coordinate delivery dates established by Owner with the project schedule.
4. Owner-Furnished Permanent Utilities: Include separate activities indicating when permanent utilities are required.
5. Activities and Work Restrictions: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames and show the effect of the following items on the schedule as applicable:
   a. Coordination with existing construction.
   b. Limitations of continued occupancies.
   c. Utility interruptions.
   d. Uninterruptible services.
   e. Partial occupancy before Substantial Completion.
   f. Use of premises restrictions.
   g. Provisions for future construction.
   h. Seasonal variations.
   i. Environmental control.
   j. Preparation and processing of submittals.
   k. Mobilization and demobilization.
   l. Work by Owner that may affect or be affected by Contractor's activities.
6. Work Stages: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
   a. Fabrication.
   b. Installation.
   c. Tests and inspections, including commissioning.
   d. Adjusting.
   e. Startup and placement into final use and operation.
7. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Structural frame completion.
   b. Permanent building enclosure.
   c. Substantial Completion of mechanical installation.
   d. Substantial Completion of electrical installation.
   e. Substantial Completion.
   f. Final Completion.
8. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
9. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed (Commencement of the Work), Substantial Completion, and Final Completion.

F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

1. Contractor shall assign cost to construction activities on the CPM schedule per the General Conditions. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be assigned to closeout activities including testing and commissioning activities, delivery of operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training, if applicable.
2. Each activity cost shall reflect an accurate value subject to approval by Architect.

G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of all activities and relationships that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

H. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

I. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.

1. SureTrak Project Manager or alternate software acceptable to Owner and Architect.

2.3 RECOVERY SCHEDULE

A. Where required by the General Conditions, provide a recovery schedule.

B. Recovery Schedule Requirements:

1. The Contractor shall prepare and submit to the Owner a one-month maximum duration Recovery Schedule, which demonstrates how the progress of the Work will return to the approved Construction Schedule at the earliest possible time. The Contractor shall prepare a Recovery Schedule to same level of detail as the Construction Schedule for a maximum duration of one month. This Recovery Schedule shall be prepared in coordination with other separate contractors on the Project.
2. Contractor shall advise the Owner of the effectiveness of the Recovery Schedule during the schedule recovery time period. At the conclusion of the one month schedule recovery period, the Owner will direct the Contractor as follows:
   a. If the Owner determines the Contractor is still behind schedule, the Owner will direct the Contractor to prepare a Schedule Revision and comply with all of the

requirements of a Schedule Revision as stated herein and the other requirements of the Contract Documents; provided, however, that nothing herein shall limit in any way the rights and remedies of the Owner as provided elsewhere in the Contract Documents.

b. If the Owner determines the Contractor has successfully complied with provisions of the Recovery Schedule, the Owner will direct the Contractor to return to the use of the approved Construction Schedule.

2.4 SCHEDULE REVISIONS

A. Should Contractor desire to or be required under the Contract Documents to make modifications or changes in his method of operation, his sequence of Work or the durations of the activities in the Construction Schedule, the Contractor shall do so in accordance with the requirements of the Contract Documents. Revisions to the approved Construction Schedule shall be identified by the Contractor in writing and approved in writing by the Owner prior to incorporation into the approved schedule.

B. Logic modifications associated with change orders shall affect only those activities and performance dates directly concerned. Adjustments in scheduled intermediate Completion Dates or for the Contract as a whole will be considered only to the extent that there is insufficient remaining float to absorb these changes.

C. Revisions to Contractor's Construction Schedule required under terms of this Section shall not modify the Contract Time or any Milestone Date and shall not modify or limit the Contractor's obligations under this Contract.

D. If there are separate contractors on the Project, prior to the submission by the Contractor of proposed schedule revision, the Contractor shall meet with and gain written approval of the separate contractors to make the revisions which shall be evidenced by the signatures of said separate contractors on the proposed schedule revisions. If accepted by the Owner the revisions shall be binding upon Contractor and all separate contractors on the Project.

1. Separate contractors include hazardous material remediation contractor. Schedule shall address testing and monitoring associated with remediation.

E. Submittal of any proposed schedule revisions by the Contractor certifies that he will prosecute the Work in accordance with the schedule revision, subject to any change therein which is implemented in accordance with the Contract Documents.

2.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording, at a minimum, the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Meetings and significant decisions.
8. Unusual events (refer to special reports).

9. Stoppages, delays, shortages, and losses.
10. Meter readings and similar recordings.
11. Orders and requests of authorities having jurisdiction.
12. Change Orders received and implemented.
13. Construction Change Directives received and implemented.
14. Services connected and disconnected.
15. Equipment or system tests and startups.
16. Partial Completions and occupancies.
17. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation on CSI Form 13.2A or alternate form acceptable to Architect. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule <u>one week in advance of</u> the regularly scheduled monthly meeting designated for the review of the project schedule by the architect.

1. Revise schedule after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Start Dates, Actual Finish Dates and an accurate Completion Percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, and additional parties determined by the Contractor.

1. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

B. Comply per paragraphs 3.10.1 thru 3.10.3 Contractor's Construction Schedule, 3.11 Documents and Samples at the Site and 3.12.1 thru 3.12.10 Shop Drawings, Product Data and Samples, under the A201 General Conditions of the Contract for Construction As Modified. The following below, shall not supercede those General Conditions.

1.2 SUMMARY

A. Section includes requirements for submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with start-up construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
   a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Electronic (CADD) Files: The Contractor may request electronic (CADD) files utilizing the Architect's Request Form.

B. Completeness: Submittals shall be complete in every respect and bound in sets. Each Submittal shall be clearly marked to show each item, component and optional feature proposed to be incorporated into the Project.
   1. Incomplete submittals may be returned without action. Incomplete submittal packages returned without action or for additional information are not subject to delay claims.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
   3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
   4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
   5. Color Selection: In individual specification sections, specific items are identified which require color/finish selections to be made by the Architect from color chart or sample submittals. The Submittal Schedule prepared by the Architect identifies these required color/finish submittals. The Architect will make coordinated selections of colors/finishes for the building interior, present the resulting color concepts to the Owner for approval, and prepare the actual Color Schedule for the Work.
      a. Submittals requiring color selection must be submitted by Contractor and approved by Architect for conformance with Contract Documents prior to the start of the color selection process. When the submittals have been approved for conformance with Contract Documents, the process for color selection, presentation of color concepts, Owner approval, and Color Schedule preparation will begin.
      b. After approval of all interior color related submittals for conformance with Contract Documents, the Contractor shall allow a minimum of thirty (30) days for the color selection, Owner's approval process, and preparation of the Color Schedule.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, in accordance with General Conditions and as follows. No extension of the Contract Time will be

authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow sufficient time for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow sufficient time for review of each resubmittal.
4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing or to allow for a resubmittal, if necessary.

E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Include the following information on an inserted cover sheet:
   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name of General Contractor
   e. Name of firm or entity that prepared submittal.
   f. Name of subcontractor.
   g. Name of supplier.
   h. Name of manufacturer.
   i. Number and title of appropriate Specification Section.
   j. Drawing number and detail references, as appropriate.
   k. Location(s) where product is to be installed, as appropriate.
   l. Related physical samples submitted directly.
   m. Other necessary identification.
5. Include the following information as keywords in the electronic file metadata:
   a. Project name.
   b. Number and title of appropriate Specification Section.
   c. Manufacturer name.
   d. Product name.

F. Options: Identify options requiring selection by the Architect.

G. Deviations: Identify deviations from the Contract Documents on submittals.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents,

including minor variations and limitations. Include same identification information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block and clearly indicate extent of revision.
   3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

K. Shop Drawings Statement: As indicated per 3.12.7 A201 General Conditions of the Contract for Construction As Modified, all copies of Shop Drawings, submitted for approval shall bear the following statement: "Checked and certified correct for conformance with the Contract Documents." This statement shall be dated and signed by the Contractor and shall appear on each submittal. One copy of each approved submittal shall be kept at the job site all times.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
   1. Electronic submittals are acceptable and preferred on this project. Prior to construction, the Contractor, Owner and Architect shall discuss the method for exchanging files. Use of the Architect's Newforma InfoExchange website and procedures can be used at no charge. If the Contractor chooses to use a different platform and methodology:
      a. The Architect and Owner may reject the methodology or platform proposed and
         1) the project team will use the Architect's Newforma InfoExchange website with the Owner's separate website software, or
         2) if necessary the project team will revert to traditional hard-copy exchange except only electronic for Owner's separate website software, or
      b. If the Contractor's platform and methodology is acceptable, the Contractor shall bear all costs for software, licensing, and training for all members of the project team.
   2. Post electronic submittals as PDF electronic files directly to Project Web site and Architect's FTP site specifically established for Project.
      a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
   3. Submit electronic submittals via email as PDF electronic files.

a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
   1) Per 3.12.7 A201 General Conditions of the Contract for Construction As Modified, the Contractor shall furnish to the field as many prints of the approved Shop Drawings as maybe required.
b. When feasible, avoid use of any PDF annotation and markups that do no print or are hidden when printed.

4. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
5. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
   b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
6. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
   1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
   2. Mark each copy of each submittal to show which products and options are applicable.
   3. Include the following information, as applicable:
      a. Manufacturer's catalog cuts.
      b. Manufacturer's product specifications.
      c. Standard color charts.
      d. Statement of compliance with specified referenced standards.
      e. Testing by recognized testing agency.
      f. Application of testing agency labels and seals.
      g. Notation of coordination requirements.
      h. Availability and delivery time information.
   4. For equipment, include the following in addition to the above, as applicable:
      a. Wiring diagrams showing factory-installed wiring.
      b. Printed performance curves.
      c. Operational range diagrams.
      d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
   5. Submit Product Data before or concurrent with Samples.
   6. Submit Product Data as PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Compliance with specified standards.
   d. Notation of coordination requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Seal and signature of professional engineer if specified.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1067 mm).
3. Submit Shop Drawings as PDF electronic file.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit four sets of Samples. Architect will retain three Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project record sample.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.
5. Submit product schedule in the following format:

a. PDF electronic file.

F. Application for Payment: Comply with requirements in the General Conditions.

G. Schedule of Values: Comply with requirements in the General Conditions.

H. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.
~~4.~~ Submit subcontract list as PDF electronic file.

I. Coordination Drawings: Comply with requirements specified in Division 01 Section “Project Management and Coordination.”

J. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

K. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

L. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

M. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

N. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

O. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

P. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

Q. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

R. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

S. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section “Quality Requirements.”

T. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

U. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

V. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

W. Maintenance Data: Comply with requirements specified in Division 01 Section “Operation and Maintenance Data.”

X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads.

Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally-signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section “Closeout Procedures.”

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. The Architect will attach a comment sheet that will indicate what “action” the Contractor shall take. “Actions” and review procedure will be clarified at the Preconstruction Conference.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

E. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

F. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

REQUEST FORM FOR ELECTRONIC FILES

Project Name: NORFOLK SCOPE COMPLEX IMPROVEMENTS - PHASE 1
Project Location: 201 E BRAMBLETON AVE, NORFOLK, VA 23510
Project Owner: CITY OF NORFOLK - DEPARTMENT OF PUBLIC WORKS
Moseley Architects Project Number: 521650

THIS FORM IS NOT A PART OF THE BID DOCUMENTS OR CONTRACT DOCUMENTS FOR THE PROJECT NAMED ABOVE.

In order to request Electronic Files (CADD files (which may include Revit, BIM, and/or AutoCad), Scans, PDFs, TIFFs etc) from Moseley Architects, this Request Form must be submitted to Moseley Architects fully executed as indicated, and with no modifications. **To avoid unnecessary time and expense in the preparation and transmittal of requested files, Moseley Architects will respond to only one request, so all desired files are to be indicated in the initial request. Subsequent requests for additional files or copies of the originally transmitted files may be denied. There are limitations to the type of file, when it will be made available, and to whom it will be made available.**

The Recipient named below agrees, without exception, to the following terms and conditions:

1. Recipient confirms its request to Moseley Architects for electronic files listed below, which Recipient understands are to be provided only in accordance with, and conditioned upon, the terms and conditions of this Request Form.
2. Moseley Architects agrees that Recipient may use the electronic files for the sole purpose of responding to Owner's request for information related to the Project. Any electronic files provided are strictly for the use of the Recipient in regard to the Project named above, and shall not be utilized for any other purpose or provided by the Recipient to any entity other than its subcontractors for the Project named above.
3. Recipient acknowledges: (1) that the Electronic Files do not contain all of the information of the Bid Documents or Contract Documents for the construction of the Project; (2) that information in the Bid Documents or Contract Documents may be revised or modified in the future; and (3) that Moseley Architects does not have and will not have any duty or obligation to advise or give notice to Recipient of any such revisions or modifications. Recipient agrees that its use of the electronic files is at the Recipient's sole risk of liability, and that the Recipient shall make no claim or demand of any kind against Moseley Architects arising out of Recipient's receipt or use of the Electronic Files.
4. Moseley Architects makes no representation or warranty of any kind, express or implied, with respect to the Electronic Files and specifically makes no warranty that the Electronic Files shall be merchantable or fit for any particular purpose, or accurate or complete. Furthermore, any description of said Electronic Files shall not be deemed to create an express warranty that such Electronic Files shall conform to said description.
5. Electronic Files are provided strictly as a courtesy by Moseley Architects solely for the convenience of the Recipient, and are not part of the Bid Documents or Contract Documents for the Project. As stated herein, the possibility exists that the Electronic Files provided may differ from the Bid Documents or Contract Documents for construction of the Project. Moseley Architects shall not be responsible for differences between Electronic Files, the Bid Documents, and Contract Documents. The Bid Documents or Contract Documents for the Project may be modified by Moseley Architects at any time, either before or after construction begins. Moseley Architects has no responsibility, either before or after any such modification, to determine or to advise the Recipient whether any such modification causes Electronic Files provided to the Recipient to be out of date, inconsistent with the Bid Documents or Contract Documents, or otherwise unsuitable or unfit for use in any way. The Recipient assumes all risk and liability for any losses, damages, claims, or expenses resulting from its receipt, use, or possession of Electronic Files furnished by Moseley Architects.
6. The Recipient agrees to indemnify, defend and hold harmless Moseley Architects, its officers, agents, employees, and Owner from and against any and all claims, suits, losses, damages or costs, including attorney's fees, arising from or by reason of the Recipient's use of Electronic Files provided by Moseley Architects, and such defense and indemnification obligation duties shall survive any use under this Request Form.
7. All CADD files provided by Moseley Architects hereunder shall be in a format/version determined solely by Moseley Architects. The Recipient agrees that Moseley Architects shall have no responsibility whatsoever for problems of any nature arising from the conversion of the files by the Recipient or others for use in non-native applications. Moseley Architects will not provide files in compressed formats. Recipient agrees to accept the files in the format provided by Moseley Architects, and that Recipient's conversion shall be at Recipient's sole risk.
8. Recipient acknowledges: (1) the CADD files provided by Moseley Architects are a graphical representation of the building in order to generate two-dimensional industry standard drawings; (2) the CADD data may not be 100% accurate and shall not be used for dimensional control, building layout, shop drawings, or any other similar purpose; (3) any schedule of materials produced directly from the CADD files have not been checked for accuracy; and (4) the information in the CADD files shall be used only for comparative purposes and shall not be relied upon for accurate quantity estimates or used in establishing pricing.
    a. Revit model files provided by Moseley Architects will only contain elements and content that Moseley Architects deems necessary and appropriate to share. No specific Level of Detail is implied or expected. The Recipient agrees that no proprietary Revit families or Revit content shall be removed from the model and/or used for any other purpose but to support this specific project.
9. Moseley Architects, at its sole discretion, may modify the Electronic files before they are provided to the Recipient. Such modifications may include, but are not necessarily limited to, removal of certain information. Moseley Architects, in its sole discretion, may refuse to provide some or all Electronic Files requested by Recipient.
10. The availability of Electronic CADD Files that were not prepared by Moseley Architects is subject to the consent of the Owner and consultant that prepared those Electronic Files. Moseley Architects will not negotiate with the Owner or consultant or repeatedly solicit the Owner or consultant to obtain such consent. Neither this Request Form nor any such separate Consultant's consent may be assigned or transferred by Recipient to any other person or entity.

11. This Request Form contains all applicable terms and conditions relating to the provision of Electronic Files to the Recipient by Moseley Architects. No other terms and conditions apply. The terms and conditions defined herein are not subject to or superceded by any provisions of the Contract Documents for the Project, nor does this Request Form modify the Bid Documents or Contract Documents.

12. This Request Form, and the use of Electronic Files, is not subject to any Uniform Commercial Code, and this Request Form shall not be construed to be a sale of any goods or products under any provision of any Uniform Commercial Code, or other statute, law or regulation and shall not be construed as an agreement for performance by Moseley Architects on behalf of the Recipient.

13. The Electronic Files provided to Recipient shall not be provided to others, except for those with direct contract with Recipient. The Electronic Files shall not be posted on any website, linked, or otherwise provided to any other person or entity. Recipient shall be responsible for any use by parties to whom the Recipient has provided the Electronic Files, including responsibility for the defense and indemnification obligation provided for in this Request Form. Recipient agrees it shall have no right to furnish or provide the Electronic Files in any litigation, administrative proceeding, arbitration or mediation unless compelled by a subpoena, statute or court order, and then not without first providing written notice of such production and the reasons therefore to the Owner and Moseley Architects.

14. Electronic Files may or may not be posted on www.moseleyarchitects.com

15. **Place a check mark next to the files requested.** Please note that some of the files indicated below may not be applicable to this project and therefore cannot be provided. The only available files identified in the table below as "CADD format" are those **comprehensive plan files** (i.e., base plans or backgrounds) listed below that are applicable to this project.

C=Contractor SS=Site Subcontractor (Div 30's)

✓	File Type	Format	Available To	Time Available:
	Civil Grading and Layout Plans	CADD	SS and C	After Bidding
	BIM Model(s)	Revit	C	After Bidding
	Architectural Floor Plans	CADD	C	After Bidding
	Roof Plans	CADD	C	After Bidding
	Reflected Ceiling Plans	CADD	C	After Bidding
	Structural Plans	CADD	C	After Bidding
	Mechanical Plans	CADD	C	After Bidding
	Electrical Plans	CADD	C	After Bidding
	Plumbing Plans	CADD	C	After Bidding
	Fire Protection Plans	CADD	C	After Bidding
	Drawings	Scans	C	After Bidding
	Project Manual	Scans	C	After Bidding

The undersigned Recipient agrees to all of the above-stated terms and conditions without exception and hereby requests the listed Electronic Files for the Project named above:

Recipient (Name of entity):

Name of authorized Recipient Representative:

Title of authorized Recipient Representative:

Signature of authorized Recipient Representative: _____

Date:

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.

1. Indicate manufacturer and model number of individual components.
2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Contractor's Quality-Control Manager Qualifications: For supervisory personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.

1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic system quality assurance plan prepared by the Architect.
2. Main wind-force resisting system or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within **10** days of Notice of Award, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
1. Project quality-control manager shall not have other Project responsibilities.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: Include in quality-control plan a comprehensive schedule of Work requiring testing or inspection, including the following:
1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.

2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:
   a. Provide test specimens representative of proposed products and construction.
   b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
   c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
   d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
   e. When testing is complete, remove test specimens, assemblies, mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at the Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
   a. Allow seven days for initial review and each re-review of each mockup.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed, unless otherwise indicated.

1.10 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor**,** and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
   a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
3. Notify testing agencies at least **24** hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section “Submittal Procedures.”

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
   1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
   1. Access to the Work.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   4. Facilities for storage and field curing of test samples.
   5. Delivery of samples to testing agencies.
   6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of the Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses. .
   1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.11 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner**,** as indicated in Statement of Special Inspections attached to this Section, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, through Construction Manager, with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

B. Comply with requirements specified in Division 01 Section “Special Inspection Services.”

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section “Execution.”

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

SECTION 014100 - SPECIAL INSPECTION SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Special Inspection services.

B. Certain structural components of the Project will be subject to the requirements for Special Inspections. Special Inspections will be applicable to the following specification sections:

1. Section 033000 Building Cast-In-Place Concrete
2. Section 050519 Post-installed Concrete Anchors
3. Section 051200 Structural Steel Framing
4. Section 051213 Architecturally Exposed Structural Steel Framing
5. Section 054000 Cold-Formed Metal Framing

C. The Owner will procure and bear all costs of the Special Inspector and the Independent Testing Laboratory, except as otherwise noted. The Special Inspector will be the manager of the Special Inspection process. The Special Inspector checks the certification of all other inspecting agents required by Special Inspections and coordinates their activities. The Special Inspector carries the exclusive responsibility for assuring that the inspections indicated are performed. The Statement of Special Inspections will be required by the Building Official as a condition for building permit issuance.

D. Requirements for Special Inspections are outlined in the Statement and Schedule of Special Inspections included at the end of this section.

1. Specific quality-assurance and control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

E. Special Inspections are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.

F. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 01 Section "Quality Control" specifies requirements for repair and restoration of construction disturbed by inspection and testing activities.

1.3 RESPONSIBILITIES

A. Contractor Responsibilities: Contractor shall provide and include in the Contract Sum, inspections, tests, and other similar quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity.

1. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.

a. The Contractor shall correct deficiencies in work that inspections and laboratory test reports have indicated to be not in compliance with requirements.
b. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.

2. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

a. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

3. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:

a. Provide access to the Work.
b. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
c. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.

d. Provide and maintain for the sole use of the Special Inspector or Special Inspectors adequate facilities for safe storage and proper curing of test samples on the Project Site.
e. Provide the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
f. Provide security and protection of samples and test equipment at the Project Site.
g. The Contractor shall designate a representative (the superintendent or an assistant to the superintendent) who shall be the direct point-of-contact with the Special Inspector during each phase of the work. Discrepancies noted during the progress of the work will be reported to the Contractor's representative for corrective action. Communications given by the Special Inspector to the Contractor's representative shall be as binding as if given to the Contractor.

B. Special Inspector Responsibilities:

1. The Special Inspector shall conduct and interpret tests, state in each report whether test specimens comply with requirements, specifically state any deviations therefrom, and record work required and performed to correct deficiencies.
2. The Special Inspector will keep records of all inspection and tests which will be furnished to the Building Official, the Architect, and the Structural Engineer of Record.
3. The Special Inspector shall notify the Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services. All discrepancies will be brought to the immediate attention of the Contractor for correction. If discrepancies are not corrected, the discrepancies will be brought to the attention of the Building Official and the Structural Engineer of Record.
4. A final report documenting completion of all required special inspections and corrections of any discrepancies noted will be submitted to the Building Official by the Special Inspector prior to, and as a condition of, issuance of the *Certificate of Use and Occupancy*.
5. The Special Inspector shall not perform any duties of the Contractor.
6. The Special Inspector shall not release, revoke, alter, decrease or increase the Contract Document requirements.

C. Independent Testing Laboratory Responsibilities: The Independent Testing Laboratory engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Architect and the Contractor in performance of the Labortory's duties. The Laboratory shall provide qualified personnel to perform required inspections and tests.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Shall not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

D. Coordination: The Contractor and each agency engaged to perform inspection, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

1.4 SUBMITTALS

A. The Special Inspector and the Independent Testing Laboratory shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Architect.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
2. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:

a. Date of issue.
b. Project title and number.
c. Name, address, and telephone number of testing agency.
d. Dates and locations of samples and tests or inspections.
e. Names of individuals making the inspection or test.
f. Designation of the Work and test method.
g. Identification of product and Specification Section.
h. Complete inspection or test data.
i. Test results and an interpretation of test results.
j. Ambient conditions at the time of sample taking and testing.
k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
l. Name and signature of laboratory inspector.
m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

A. Qualification for Special Inspector: The Special Inspector shall be a Registered Professional Engineer, Licensed in the State of Virginia, experienced in performing special inspections and shall be approved by the Building Offical and the Architect. The credentials of all Inspectors and testing technicians shall be provided if requested.

B. Qualifications for Independent Testing Laboratory: Engage independent inspection and testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.

1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

2. Each independent Inspection and Testing Agency engaged on the Project shall demonstrate that it has the experience and capability to conduct the required field and laboratory testing without delaying the progress of the work. The minimum requirements shall be as follows:

   a. Reinforced Concrete testing
      1) **ACI-CFTT** *Concrete Field Testing Technician – Grade 1*
      2) **ACI-LTT** *Laboratory Testing Technician – Grade 1 or 2* and *Strength Testing Technician*
      3) **NICET-CT** – *Concrete Technician – Level I*

   b. Reinforced Concrete Inspection
      1) **ACI-CCI** *Concrete Construction Inspector*
      2) **ICC-RCSI** *Reinforced Concrete Special Inspector*

   c. Structural Steel
      1) **AWS-CWI** *Certified Welding Inspector*
      2) **AWS/AISC-CSI** *Certified Steel Inspector*
      3) **ICC-SWSI** *Structural Steel and Welding Inspector*

   d. Non-Destructive Testing – American Society of Non-Destructive.

B. Pre-Construction Conference – Prior to the start of project construction, the Special Inspector shall conduct a Pre-Construction Conference to discuss the requirements for Special Inspections as well as the Administrative Procedures to be followed during the course of the project. Protocols for notification, documentation, and individual responsiblilities shal be reviewed. Attendees shall include, but are not limited to:
1. Owner
2. Owner's Project Manager
3. Owner's Project Inspector
4. Owner's Independent Testing Agency
5. Architect
6. Structural Engineer
7. Contractor's Project Manager
8. Contractor's Superintendent

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.

C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION 014100

STATEMENT OF SPECIAL INSPECTIONS

PROJECT

Norfolk Scope Complex Improvements - Phase 1

201 E Brambleton Ave

Norfolk, VA 23510

PERMIT APPLICANT

PRIMARY RDP OF RECORD

Moseley Architects

780 Lynnhaven Parkway, Ste 200

Virginia Beach, VA 23452

STRUCTURAL ENGINEER OF RECORD

Stroud, Pence & Associates, Ltd.

5032 Rouse Drive, Suite 200

Virginia Beach, Va 23462

This Statement of Special Inspections is submitted as a condition for permit issuance in accordance with the International Building Code (IBC) as stated in the Virginia Uniform Statewide Building Code (USBC). It includes a Schedule of Special Inspections applicable to this project as well as the name of the Special Inspector, and the identity of other testing laboratories or agencies intended to be retained for conducting these inspections or tests.

The Special Inspector shall keep records of all inspections, and shall furnish inspection reports to the Building Official, appropriate Registered Design Professional(s) (RDP(s)), Owner and Contractor. All discrepancies shall be brought to the immediate attention of the Contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and appropriate RDP(s). Interim reports shall be submitted to the Building Official, Owner, Contractor, and the appropriate RDP(s).

Jobsite safety is solely the responsibility of the contractor. Materials and activities to be inspected are not to include the contractor's equipment and methods used to erect or install the materials listed. **All fees/costs related to the performance of Special Inspections shall be the responsibility of the Owner. Additionally, the undersigned (RDP or SER) are only acknowledging that the items enumerated on the Schedule of Special Inspections are consistent with the required design elements, the applicable sections of the Uniform Statewide Building Code, and their area of expertise.**

REVIEW, AUTHORIZATION & ACCEPTANCE

Permit Applicant *(If not Owner)*:

Signature / date:

Printed Name:

Owner's Authorization *(If other than Applicant)*:

Signature / date:

Printed Name: Bob Jackson

Primary RDP of Record:
(Review and Acceptance of Schedule)

Signature / date: 1/14/16

Printed Name: Jeff Hyder

SER of Record: (Review and Acceptance of Schedule)

Signature / date: 1/14/16

Printed Name: Justin D. Trent, P.E., CSI, CDT

Building Official's Acceptance:

Signature / date:

Printed Name:

COMMONWEALTH OF VIRGINIA
Justin D. Trent
Lic. No. 047780
PROFESSIONAL ENGINEER

Virginia RDP Seal of SSI Preparer

Justin D. Trent, P.E., CSI, CDT

Printed Name of the Preparer of the Schedule (on line above)

Special Inspector:

Signature / date: 1/14/16

Printed Name: Justin D. Trent, P.E., CSI, CDT

SI Company Name: Stroud, Pence & Associates, Ltd.

(Revision date 3/23/11)

SCHEDULE OF SPECIAL INSPECTIONS

MATERIAL/ACTIVITY	TYPE OF INSPECTION	APPLICABLE TO THIS PROJECT			
		Y/C/P/N	EXTENT/REFERENCE	AGENT	COMPLETED
GENERAL					
Pre-construction conference	Meeting with parties listed in Section 6 of HRRSIGP to discuss Special Inspection procedures	Y	Scheduled by SI with the Contractor prior to commencement of work	1, 2	
EARTHWORK					
Site preparation	Field testing and inspection	N	Field Review; IBC 1704.7		
Fill material	Review submittals, field testing and inspection	N	Field Review; IBC 1704.7		
Fill compaction	In-place density tests	N	Field Review; IBC 1704.7		
Foundation sub-grade	Field inspection of foundation subgrade prior to placement of concrete	N	Field Review; IBC 1704.7		
DEEP FOUNDATION ELEMENTS					
Materials	Review product, sizes, and lengths	N	IBC 1704.8, 09 or .10		
Test piles	Monitor driving of test piles	N	IBC 1704.8, 09 or .10		
Installation	Monitor drilling, placement, driving of piles, including cut off and tip elevation	N	IBC 1704.8, 09 or .10		
Pile load test	Monitor pile load test	N	IBC 1704.8, 09 or .10		
CONCRETE					
Materials	Review product supplied versus certificates of compliance and mix design	Y	Submittal & Field Review; IBC 1704.4.1; ACI 318: Ch. 4 and 5; IBC 1904.2.2, 1913.2, 1913.3	2	
Installation of reinforcing steel, including prestress tendons, anchor rods and welding	Field inspection of reinforcement placement	C	Field Review; ACI 318:3.5, 3.5.2 & Ch. 7; AWS D1.4; IBC 1704.4, 1911.5, 1913.4	1	
Formwork installation	Field inspection	N	Field Review; ACI 318: 6.1.1; IBC 1704.4		
Concreting operations and placement	Field inspection of placement/sampling – 5 sets per each mix type minimum	P	Field Review; ACI 318: 5.6, 5.8, 5.9-10; ASTM C 172, C 31; IBC 1704.4, 1913.6, 1913.7, 1913.8, 1913.10	2	
Concrete curing	Field inspection of curing process	Y	Field Review; ACI 318: 5.11-13; IBC 1704.4, 1913.9	2	
Concrete strength	Evaluation of concrete strength	Y	Laboratory Testing; ACI 318: 6.2; IBC 1704.4	2	
Application of forces for prestressed concrete	Field inspection	N	Field Review; ACI 318: 18.20		
Grouting of prestress tendons	Field inspection	N	Field Review; ACI 318: 18.18.4		
PRECAST CONCRETE					
Verify fabrication/quality control procedures	In-plant inspection of fabrication/quality control procedures**	N	IBC 1704.2		
Erection and installation	Review submittals and as-built assemblies; Field inspection of in-place precast	N	ACI 318: Ch. 16; IBC Table 1704.4		

(Revision date 3/23/11)

MATERIAL/ACTIVITY	TYPE OF INSPECTION	APPLICABLE TO THIS PROJECT			
		Y/C/P/N	EXTENT/REFERENCE	AGENT	COMPLETED
MASONRY (Level 1 or 2 ; Based on Building Category 1 or 2)					
Materials	Review of products supplied versus certificate of compliance and material submitted	N	Submittal & Field Review; ACI 530.1; ASCE 6; TMS 602; IBC 1704.5, 1708		
Strength	Testing/review of strength	N	Submittal & Field Review; ACI 530.1; ASCE 6; TMS 602; IBC 1704.5, 2105.2.2, 2105.3		
Mortar and Grout	Inspection of proportioning and mixing. Placement of mortar only.	N	Field Review; IBC 1704.5, ACI 530.1; ASCE 6; TMS 602		
Grout placement, including prestressing grout	Verification to ensure compliance	N	Field Review; IBC 1704.5; ACI 530.1; ASCE 6; TMS 602		
Grout space	Verification to ensure compliance	N	Field Review; IBC 1704.5; ACI 530.1; ASCE 6; TMS 602		
Mortar, grout and prism specimens	Observe preparation	N	Field Review; IBC 1704.5; ACI 530.1; ASCE 6; TMS 602		
Reinforcement, prestressing tendons, and connections	Inspect condition, size, location, and spacing	N	Field Review; IBC 1704.5, ACI 530.1; ASCE 5; ASCE 6; TMS 402, 602		
Welding of reinforcing bars	Inspection and testing of welds	N	Field Review; IBC 1704.5, ACI 530.1; ASCE 5; TMS 402		
Prestressing force	Verify application and measurement	N	Field Review; IBC 1704.5, ACI 530.1; ASCE 6; TMS 602		
Protection	Inspect procedures for protection during cold and hot weather	N	Field Review; IBC 1704.5, 2104.3, 2104.4; ACI 530.1; ASCE 6; TMS 602		
Anchorage	Inspection of anchorages	N	Field Review; ACI 530.1; ASCE 5; ASCE 6; TMS 402; TMS 602; IBC 1704.5		
Masonry installation	Inspection of placement of masonry and joints	N	Field Review; ACI 530.1; ASCE 6; TMS 602; IBC 1704.5		
STRUCTURAL STEEL					
Verify fabrication/quality control procedures	In-plant inspection of fabrication/quality control procedures**	Y	IBC 1704.2	2	
Bolts, nuts, and washers – materials	Material identification markings Review of certificate of compliance	Y	Submittal & Field Review; IBC 1704.3; ASTM; AISC 360, Section A3.3	1	
Bolts, nuts, washers – installation	Inspection of in-place high-strength bolts, bearing type, and slip critical connections	Y	Submittal & Field Review; IBC 1704.3.3, AISC 360 Section M2.5	2	
Structural steel – materials	Material identification markings and review of Certificate of Compliance	Y	Submittal & Field Review; IBC 1704.3, 1708.4, ASTM A6, A568	2	
Structural steel details – installation	Inspection of member locations, structural details for bracing, connections, stiffening	Y	Submittal & Field Review; IBC 1704.3.2	1,2	
Weld filler materials and welder certification	Review of identification markings, certificate of compliance, and welder certifications	Y	Submittal & Field Review; AISC 360 A3.5	2	
Welds	Inspection and testing of welds	Y	Field Review; IBC 1704.3.1; AWS D1.1, D1.3	2	
Cold-formed steel trusses	Inspection of temporary and permanent restraints/bracing	N	Field Review; IBC 1704.3.4		

MATERIAL/ACTIVITY	TYPE OF INSPECTION	APPLICABLE TO THIS PROJECT			
		Y/C/P/N	EXTENT/REFERENCE	AGENT	COMPLETED
WOOD					
Verify fabrication/quality control procedures	In-plant inspection of fabrication/quality control procedures**	N	IBC 1704.2, 1704.6		
Light Framed Wood Construction	Review as-built assemblies; Inspection of sheathing, framing size, nail diameter and length, number of fastener lines, and fastener spacing.	N	IBC 1704		
Metal Plate Connected wood trusses (60'+)	Approved bracing with submittal	N	IBC 1704.6.2		
High-Load Diaphragms- Installation	Review submittal and as-built assemblies; Inspection of sheathing, framing size, nail diameter and length, number of fastener lines, and fastener spacing.	N	IBC 1704.1, 1704.6.1		
SPRAYED CEMENTITIOUS AND MINERAL FIBER FIRE RESISTIVE MATERIAL					
Structural member surface conditions	Field Review of surface conditions prior to application	N	AWCI 12-B; IBC 1704.12		
Application/thickness	Field review of application operations and thickness	N	ASTM E605; AWCI 12-B; IBC 1704.12		
Mastic & Intumescent Fire Resistant Coating	Field review of application operations and thickness	N	AWCI 12-B; IBC 1704.13		
EXTERIOR INSULATION AND FINISH SYSTEMS					
Applications not over CMU or Concrete	Field Review of application/installation	N	ASTM E2570; IBC 1704.14		
SPECIAL CASES – Cold Formed Metal Framing					
Alternative Materials and Systems	*As requested by Building Official, review system and installation*	Y	IBC 1704.15	1,2	
MAIN WIND FORCE RESISTING SYSTEM					
Wind requirements	Review of the system components and installation	N	IBC 1609.1.2. 1705.4, 1705.4.1, 1705.4.2, 1710		
SEISMIC FORCE RESISTING SYSTEMS					
Seismic requirements	Review of the designated seismic systems and seismic force resistance systems	N	IBC 1613, 1705.3, 1705.3.1, 1707, 1708, 1710.2; ASCE 7		
SMOKE CONTROL					
Special Inspection of smoke control systems	Leakage testing and recording of device location. pressure difference testing, flow measurement and detection, and control verification	N	IBC 1704.16, 1704.16.1, 1704.16.2		

INSPECTION AGENTS	FIRM	ADDRESS	TELEPHONE
1. Special Inspector:	Stroud, Pence and Associates, Ltd.	5032 Rouse Dr., Virginia Beach, VA 23462	757-671-8626
2. Materials and Testing Laboratory:	TBD		
3. Special Inspector Smoke Control System:			
4. (Additional Agents?)			

Note: * The Qualifications of the Special Inspector and Testing Laboratories are subject to the Approval of the Building Official.
** Inspection of quality control procedures required only if fabricator is not regularly inspected by an independent inspection agency.

SECTION 014200 – REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the General Conditions of the Contract. The definitions of this section are in addition to, not in place of, those found in the General Conditions.

B. "Approved": The term "approved," when used in conjunction with Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.

D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at Project site including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Installer": An installer is Contractor or another entity engaged by Contractor, as an employee, subcontractor, or contractor of lower tier, to perform a particular construction operation, including installation, erection, application, and similar operations.

   1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

I. The term "experienced," when used with the term "installer," means having successfully completed a minimum of **five** previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.

J. "Replace": The term "replace" means to provide an acceptable like product or material in the place of a missing or unacceptable (rejected) product or material. To "replace" an unacceptable product or material includes its removal and disposal. (The term "reinstall" shall be used to indicate reuse of the original.)

K. "Punch List": A "punch list" is a listing of work items required by the Contract Documents which are incomplete or non-conforming. The list of observed deficiencies is compiled in the course of review to determine if the Contractor has attained Substantial Completion. It does not constitute a definitive list of remaining work items, and does not limit, amend or supersede requirements of the Contract Documents. Completion of punchlist items is a requirement to achieve Substantial Completion, in accordance with the General Conditions.

L. "Project site" is the space available for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project. The extent of Project site is shown on the Drawings and may or may not be identical with the description of the land on which Project is to be built.

M. "Written" or "Printed" when used in conjunction with manufacturer's product handling and installation requirements means to adhere to the manufacturer's current printed and published information.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of the date of the Contract Documents, unless otherwise indicated.

C. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from the publication source and make them available on request.

E. Abbreviations and Names: Abbreviations and acronyms are frequently used in the Specifications and other Contract Documents to represent the name of a trade association, standards-developing organization, authorities having jurisdiction, or other entity in the context of referencing a standard or publication. Where abbreviations and acronyms are used in the

Specifications or other Contract Documents, they mean the recognized name of these entities. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 014520 - TESTING, ADJUSTING, AND BALANCING (TAB)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

B. Balance: To proportion flows within the distribution system, including sub-mains, branches, and terminals, according to design quantities.

C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.

D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.

E. Report Forms: Test data sheets for recording test data in logical order.

F. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.

G. Suction Head: The height of fluid surface above the centerline of the pump on the suction side.

H. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

I. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.

J. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.

K. Test: A procedure to determine quantitative performance of a system or equipment.

L. TAB Agent: The entity responsible for performing and reporting the TAB procedures.

M. AABC: Associated Air Balance Council.

N. AMCA: Air Movement and Control Association.

O. CTI: Cooling Tower Institute.

P. NEBB: National Environmental Balancing Bureau.

Q. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

R. TAB: Testing, Adjusting, and Balancing

1.3 SUBMITTALS

A. Quality-Assurance Submittals: Within 30 days of the Contractor's Notice to Proceed, submit evidence that the TAB Agent and this Project's TAB team members meet the qualifications indicated in the "Quality Assurance" Article below.

B. Warranty: Submit warranties indicated below.

C. Special Guarantee: Submit Special guarantee indicated below

D. Contract Documents Examination Report: Within 60 days of the Contractor's Notice to Proceed, submit the Contract Documents review report as indicated in Part 3 below.

E. Strategies and Procedures Plan: Within 90 days of the Contractor's Notice to Proceed, submit the TAB strategies and step-by-step procedures as indicated in Part 3 below. Include a complete set of report forms intended for use on this Project.

F. Testing Adjusting and Balancing Conference Notification: Within 120 days of the Contractor's Notice to Proceed, submit the testing adjusting and balancing conference notification. The notification shall include the date, time and location of the conference as well as a list of attendees.

G. TAB Conference Minutes: Within 180 days of the Contractor's Notice to Proceed, submit the TAB conference minutes. Minutes shall include a list of attendees and a record of the discussions and decisions made during the conference.

H. System Readiness Reports: 60 days prior to substantial completion the contractor performing work under section "Building Automation System" (BAS) shall complete pre-commissioning checklists. The contractor performing work under this section shall, as part of the system readiness report, witness pre-commissioning activities and shall initial each element on the pre-commissioning checklist. The system readiness report shall be completed and submitted as specified. Do not include the checklists as they will be submitted under section "BAS".

I. Certified TAB Reports: Within 60 days of substantial completion submit the testing and balancing reports prepared, as indicated in this Section, on approved forms certified by the TAB Agent.

1. Balancing report.

1.4 QUALITY ASSURANCE

A. Agent Qualifications: Agent and agent's representatives shall be certified by either AABC or NEBB. The testing and balancing agent shall be one of the following:

1. C&W Tesco, Inc.
   430 Southlake Boulevard, Suite B-12
   Richmond, VA 23236
   804.379.9345

2. Complete Commissioning, Inc.
   6304 Aaron Lane
   Clinton, MD 20735
   301.877.2260

3. Mechanical Systems Testing and Balancing, Inc. (MSTB)
   7314 Impala Drive
   Richmond, Virginia 23228
   804.264.0454

4. Testing Specialties, Inc.
   PO Box 2788
   Chesapeake, VA 23327
   757.436.2345

B. Testing and Balancing Agents not listed shall be permitted to bid. The following information shall be submitted as part of the Quality Assurance Submittal:

1. Provide evidence of satisfactory completion of at least two projects of similar size and scope. Submit the following for each project:
   a. Completed testing and balancing reports for each project.
   b. If not included in the testing and balancing report, provide equipment startup checklists for each project.
   c. Owner contact for each project.
   d. Design engineer contact for each project.
   e. Architect contact for each project.

2. The architect shall determine whether the agent is qualified and the decision shall be final. Re-submittals on behalf of the same company shall not be considered.

C. TAB Conference: Meet with the Owner's and the Architect's representatives on approval of the TAB strategies and procedures plan to develop a mutual understanding of the details. Ensure the participation of TAB team members, equipment manufacturers' authorized service representatives, HVAC controls Installer, and other support personnel. Set meeting and submit TAB Conference Notification.

1. Minimum Agenda:
   a. Submittal distribution requirements.
   b. Contract documents examination report.
   c. TAB plan.
   d. Work schedule and project site access requirements.
   e. Coordination and cooperation of trades and subcontractors.

f. Coordination of documentation and communication flow.

D. TAB Reports: Use standard forms from AABC's "National Standards for TAB" or NEBB's "Procedural Standards for TAB of Environmental Systems."

E. Instrumentation Type, Quantity, and Accuracy: As described in NEBB's "Procedural Standards for TAB of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."

F. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

1.5 PROJECT CONDITIONS

A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire TAB period. Minimize conflicts with the Owner's operations.

1.6 COORDINATION

A. Coordinate the efforts of work performed under other sections for operation of systems and equipment to support and assist TAB activities.

B. Notice: Provide 7 days' advance notice to the contractor and Moseley Architects for each test. Include scheduled test dates and times.

C. Perform TAB after leakage and pressure tests on air, water, potable water, and non potable water distribution systems have been satisfactorily completed.

1.7 WARRANTY

A. General Warranty: The national project performance guarantee indicated in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Guarantee: Provide a guarantee on NEBB or AABC forms stating that NEBB or AABC will assist in completing the requirements of the Contract Documents if the TAB Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:

1. The certified Agent has tested and balanced systems according to the Contract Documents.

2. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

1. Balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are hereby required by the Contract Documents.
2. Verify that quantities and locations of devices proposed by the contractor and indicated on the Contract Documents are accessible and appropriate for effective balancing and efficient system and equipment operation.
3. Verify flow rates specified and compare to central equipment capacities.
4. Identify discontinuities and omissions in the Contract Documents.
5. Provide a detailed Testing and Balancing plan within six weeks of the Notice to Proceed.
6. Record configuration, set up, parameters, etc, that change during the testing period.
7. Respond to Warranty issues. Record configuration, set up, parameters, etc, that change during the warranty period.

B. Examine BAS submittal data prior to submission and provide comments to contractor, and Moseley Architects.

C. Examine submittal data of HVAC systems and equipment prior to submission and provide comments to contractor, and Moseley Architects.

D. Examine project record documents and provide comments to contractor, and Moseley Architects.

E. Examine Architect's design data, including HVAC system descriptions, statements of design, assumptions for environmental conditions, control drawings, and statements concerning systems and equipment.

F. Examine equipment performance data, including fan and pump curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.

G. Examine system and equipment installations to verify that they are complete and that TAB, and cleaning indicated has been performed.

H. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.

I. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

J. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment is ready for operation, including functioning controls.

K. Examine terminal units, such as variable-air-volume boxes and mixing boxes, to verify that they are accessible and their controls are connected and functioning.

L. Examine strainers for clean screens and proper perforations.

M. Examine 3-way valves for proper installation for their intended function of diverting or mixing fluid flows.

N. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

O. Examine open-piping-system pumps to ensure absence of entrained air in the suction piping.

P. Examine equipment for installation and for properly operating safety interlocks and controls.

Q. Examine automatic temperature system components to verify the following:

1. Dampers, valves, and other controlled devices operate by the intended controller.
2. Dampers and valves are in the position indicated by the controller.
3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in mixing boxes and variable-air-volume terminals.
4. Automatic modulating and shutoff valves, including 2-way valves and 3-way mixing and diverting valves, are properly connected.
5. Thermostats are located to avoid adverse effects of sunlight, drafts, and cold walls.
6. Sensors are located to sense only the intended conditions.
7. Sequence of operation for control modes is according to the Contract Documents.
8. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.
9. Interlocked systems are operating.
10. Changeover from heating to cooling mode occurs according to design values.

R. Report deficiencies discovered before and during performance of TAB procedures.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system readiness checks and prepare system readiness reports. Verify the following:

1. Permanent electrical power wiring is complete.
2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
8. Windows and doors can be closed so design conditions for system operations can be met.

3.3 GENERAL TESTING AND BALANCING PROCEDURES

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC national standards or NEBB's "Procedural Standards for TAB of Environmental Systems" and this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.

C. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.4 MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:

1. Manufacturer, model, and serial numbers.
2. Motor horsepower rating.
3. Motor rpm.
4. Efficiency rating if high-efficiency motor.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter thermal-protection-element rating.

B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass to prove proper operation. Record observations, including controller manufacturer, model number, serial number, and nameplate data.

3.5 TEMPERATURE-CONTROL VERIFICATION

A. Verify that controllers are calibrated and commissioned.

B. Check transmitter and controller locations and note conditions that would adversely affect control functions.

C. Record controller settings and note variances between set points and actual measurements.

D. Verify operation of limiting controllers (i.e., high- and low-temperature controllers).

E. Verify free travel and proper operation of control devices such as damper and valve operators.

F. Verify sequence of operation of control devices. Note air pressures and device positions and correlate with air, water, and potable water-flow measurements. Note the speed of response to input changes.

G. Confirm interaction of electrically operated switch transducers.

H. Confirm interaction of interlock and lockout systems.

I. Verify main control supply-air pressure and observe compressor and dryer operations.

J. Record voltages of power supply and controller output. Determine if the system operates on a grounded or non-grounded power supply.

K. Note operation of electric actuators using spring return for proper fail-safe operations.

3.6 TOLERANCES

A. Set system airflow, water, and potable water-flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans: 0 to plus 10 percent.
2. Air Outlets: minus 10 percent to plus 10 percent.
3. Return Inlets: minus 10 percent to plus 10 percent.
4. Exhaust Inlets: 0 to plus 10 percent.
5. Heating-Water Flow Rate: minus 5 percent to plus 5 percent.
6. Cooling-Water Flow Rate: minus 5 percent to plus 5 percent.
7. Potable water: minus 5 percent to plus 5 percent.

8. Unless indicated otherwise: minus 10 percent to plus 10 percent.

3.7 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article above, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: When 50% of the construction contract period has elapsed, the contractor performing work under this section shall visit the site twice per month thereafter. After each site visit for each system being tested and balanced, prepare a report to describe completed work, work in progress, and work at variance with the contract documents. Include a list of deficiencies and problems found in each system. Prepare a separate report for each system and each building floor for systems serving multiple floors. Submit the report to the contractor and architect. The contractor shall be responsible for ensuring that deficiencies are corrected. Deficiencies shall remain on the list permanently, shall be issued with each report, and shall be checked off only when they are corrected.

3.8 FINAL REPORT

A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.

B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.

1. Include a list of the instruments used for procedures, along with proof of calibration.

C. Final Report Contents: In addition to the certified field report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.

D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:

1. Title page.
2. Name and address of TAB Agent.
3. Project name.

4. Project location.
5. Architect's name and address.
6. Contractor's name and address.
7. Report date.
8. Signature of TAB Agent who certifies the report.
9. Table of contents.
10. Operating sequences that vary from the Contract Documents.
11. Nomenclature sheets for each item of equipment.
12. Data for terminal units, including manufacturer, type, and size.
13. Notes to explain why certain final data in the body of reports varies from design values.
14. Test conditions for fans and pump performance forms, including:
    a. Settings for outside-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Fan drive settings, including:
        1) Percentage of maximum pitch or diameter.
        2) Maximum RPM.
        3) Minimum RPM on VAV systems.
    e. Settings for supply-air static-pressure controllers on VAV systems.
    f. System operating parameters/conditions that affect performance.

E. System Diagrams: Include schematic layouts of air, water, and potable water water distribution systems. Provide single-line diagrams including the following:

1. Quantities of outside, supply, return, exhaust, and water flow rates.
2. Duct outlet, and inlet sizes.
3. Pipe sizes and locations.
4. Indicated Terminal unit(s): Information & location(s).
5. Indicated Balancing station(s): Information & location(s).
6. Indicated Meter(s): Information & location(s).

F. Test Reports:

1. All equipment test reports.
2. Duct Traverse Reports.
3. Terminal-Device Reports.
4. Coil Reports.
5. Instrument Calibration Reports.

3.9 ADDITIONAL TESTS

A. Within 90 days of completing work performed under this section, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods:

1. Winter: Re-test heating equipment, including central equipment and terminal devices, when the outside air temperature is below 30 degrees F.

2. Summer: Re-test cooling equipment, including central equipment and terminal devices, when the outside air temperature is above 90 degrees F.

END OF SECTION 014520

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1. The requirements of this section are in addition to, not in place of, those found in the General Conditions.

1.2 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Sewer Service from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Water Service: Water Service from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

D. Electric Power Service: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

E. Internet Service: Pay ISP use charges for Internet service, for use by all parties engaged in construction, at Project site.

1.5 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1. Indicate access onto the podium (plaza).
2. Coordinate with Owner and Architect, to not conflict with Owner Events including Event operations before and after the public portion of the Event.

3. Indicate if any parking in the existing garage. All fees are by Contractor.
4. Indicate any work personnel drop off and pick up areas for commuter remote offsite parking.
5. Indicate and clarify loading and staging types.
6. Indicate any temporary office trailers.
7. Indicate any temporary toilets.
8. Coordinate Site Plan submittal with Temporary Apparatus, Equipment, and Materials Loads on Existing Slabs (Podium Plaza).
9. Indicate and coordinate any required temporary facilities for Owner Events

B. Sequencing Plans:
1. Re-confirm the Architectural Sequencing Drawings with all requirements of the Work.
   a. Shall not conflict with Owner's Events.
2. Indicate if any proposed required adjustments and explain the benefits to the Owner and Architect.

C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

E. Temporary Apparatus, Equipment, and Materials Loads on Existing Slabs (Podium Plaza):
1. Submit documentation signed and sealed by a Professional Engineer licensed in the Commonwealth of Virginia, to verify that proposed temporary construction apparatus, equipment and material loads (include, but limited to cranes, lifts, trucks, portable trailers, heavy bulk materials, etc) will not overstress the existing podium (Plaza) structure. Shall also include if use of existing stairs and ramps up to the plaza.
2. Submit documentation of each type of equipment, total loads, locations, durations, and purposes.
   a. Indicate and describe each type and its location on the plaza

1) Clarify types on the plaza directly over the Exhibition Hall.

b. Clarify if using either existing stairs or ramps.

c. Avoid damaging existing waterproofing beyond the limits of patching and repair indicated on the drawings.

1) Avoid over turning of brick pavers that may tear into water proofing.

2) Avoid excessive weights of temporary equipment that may tear into the water proofing.

d. Provide and necessary surface protection over the existing brick pavers. Patch and repair any damaged due to Contractor work.

e. Protect existing drains from damage. Patch and repair any damaged due to Contractor work.

F. Temporary Enclosures: Refer to paragraph 3.4 I, below Temporary Enclosures under Security and Protection Facilities Installation.

1. Provide delegated design submittal for the approximately 41 foot tall temporary enclosure walls behind the existing curtain wall to be demolished. Refer to Architectural Demolition and Sequencing Drawings.

a. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer licensed in Virginia and responsible for their preparation.

2. Submit documentation of temporary roof enclosures at Podium (Plaza) slab openings.

a. Include and clarify large and small openings.

3. Submit documentation of temporary enclosures at door retrofits at existing curtain wall openings.

4. Submit documentation to clarify sequencing of all the work to not conflict with Owner Events.

G. Temporary Partitions and Enclosure Walls (reusable, portable, prefabricated and modular):

1. If Contractor elects this option, submit documentation clarifying the manufacturer's product data, specifications, installation, and drawings.

H. Temporary Portable Toilets and Hand washing facilities for Owner Events.

1. If Contractor elects this option, submit documentation clarifying the manufacturer's product data, specifications, installation, and drawings.

1.6 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.7 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing (Temporary Construction Fence): Minimum 2-inch (50-mm), 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.

1. Architectural Sequencing Drawings indicate dimensions to Temporary Construction Fence. The concrete base dimensions shall not exceed approximately 12” into the public egress.
2. Concrete bases shall be utilized to avoid damaging the existing water proofing of the podium (plaza). However provide concrete bases that provide the equivalent to a typical fixed fencing post, by increasing the weight and/or size.
3. Provide gates sizes and quantities to suit the Work.

B. Lumber and Plywood: Comply with requirements in Division 6 Section “Rough Carpentry.”

1. Provide FRT plywood.

C. Gypsum Board: Minimum 1/2 inch (12.7 mm) thick by 48 inches (1219 mm) wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36/C 36M.

A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).

C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

D. Tarpaulins: Fire-resistive labeled with flame-spread-rating of 15 or less.

E. Paint: Comply with requirements in Division 9 painting Sections.

1. Paint all indoor surfaces exposed to the public, up to 8 feet tall.
2. Coordinate with Owner and Architect for color.

F. Cold-Formed Metal Framing (CFSF-S): Comply per with requirements in Division 5 Cold-Formed Metal Framing Section.

1. Structural Studs and Framing.

G. Cold-Formed Steel Framing (CFSF-NS): Comply per with requirements in Division 9 Cold Formed Steel Framing – Non-Structural (CFSF-NS)

H. Sheathing: Comply per with requirements in Division 6 Sheathing.

1. Wall Sheathing: Glass-Mat Gypsum Wall Sheathing.

I. Temporary Partitions and Enclosure Walls (reusable & portable types): Reusable prefabricated modular walls for temporary indoor and outdoor use. Shall be a Contractor option but not in lieu of the performance criteria specified for both Temporary Partitions per paragraph 3.4 J and Enclosure Walls per paragraph 3.4 K.

1. Manufacturers: Subject to compliance with contract documents, the following manufacturer(s)/components/systems, but not limited by:
   a. MallForms. www.mallforms.com. 1-800-434-0444
   b. Other manufacturer(s)/product(s) may be submitted for review provided they meet or exceed the specified criteria.
2. Shall be modular to accommodate various sequencing of the Work.
3. Provide Class A materials

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with operable windows, serviceable finishes, temperature controls, and foundations adequate for normal loading. Level and anchor field office and provide landing, stairway, handrails and guardrails in accordance with requirement of local building inspector.

1. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C),
2. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
3. Drinking water and private toilet.

B. Common-Use Field Office: Offices of sufficient size to accommodate needs of construction personnel. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
2. Conference room of sufficient size to accommodate meetings of **18** individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack board.
3. Coffee machine, water and supplies.
4. Maintain the following materials, specified elsewhere, in the field office available to Architect and Owner's representative at all times:
   a. Up-to-date set of Contract Documents, including FCs, RFIs, PCOs and COs.
   b. Up-to-date set of reviewed final shop drawings.
   c. Up-to-date Contractor's Progress Schedule.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

D. Sanitary Facilities: Refer to paragraph 3.2 and provide temporary toilets, wash facilities, and drinking water. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

B. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
3. The contractor shall have the responsibility to operate the heaters in a manner that provides a safe working environment as well as maintaining the required temperatures for performance of the work.

C. Site Webcam: Exterior grade webcam to suit desired view, location, and angle, as approved by the Owner.

2.4 BIDDER/CONTRACTOR OPTIONS FOR TEMPORARY FACILITES ONLY FOR OWNER EVENTS

A. During any Event, there shall be no net loss of existing toilets, hand washing fixtures, accessible ramps and shall be complete and operational for Owner use. Coordinate the Work schedule with each Event to maintain these requirements.

1. Bidder/Contractor Option to sequence the start and completion of portions of the Work, into smaller areas.
2. Bidder/Contractor Option to sequence the start and completion of the various parts of the Work and also provide temporary facilities.

B. Bidder/Contractor Options are not a requirement of the Work, unless deemed necessary by the Bidder/Contractor, and therefore shall be incorporated into the Work. Bidder/Contractor shall determine if the Options will provide equivalent and/or better overall cost value to the Owner and/or for the bidder/Contractor. **Bidder/Contractor shall provide all related costs for Work incorporated into the Bid.** Refer to the following Bidder/Contractor Options minimum requirements.

C. Temporary Outdoor Portable Toilets, hand washing facilities, and fencing for Owner Events.

1. Sanitary Facilities: Provide temporary toilets, wash facilities for use of by the general public. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

a. Unit quantity, including ADA accessible, equal to temporary loss of plumbing fixtures per each Event. Provide delivery, removal, waste removal and maintenance.
b. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.
c. Provide portable trailer gang type units, with the following requirements:
   1) Scissor jacks on all four trailer corners.
   2) Removable aluminum steps with swing away grab bars.
   3) Coordinate temporary power requirements.
   4) Power cord(s) quantity and length to suit each location.
   5) Interior and exterior lighting.
   6) Vent fans.
   7) Automatic shut-off stainless steel sinks with composite counters.
   8) Interior mirrors.
   9) Linoluem Finish flooring and vinyl walls.
   10) Trash, soap dispensers, toilet tissue holders, paper towel dispensers.
   11) Minimum of 125 gallon fresh water tanks per 2 lavatories or equal.
   12) Minimum of 255 gallon waste tanks per 2 commodes and 1 urinal or equal.
   13) Water hose(s) quantity and length to suit each location.
   14) Waste washout connections and monitors.
   15) Self flushing porcelain urinals.
   16) Hands-free porcelain commodes.
   17) Keyed locks.
d. ADA sized units to be portable self-contained. If trailer gang type, provide ADA compliant ramp, landing and rails. Shall require inspection by the local authorities having jurisdiction.
e. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
f. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for public. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.

2. Chain-Link Fencing (Temporary Event Fence): Minimum 2-inch (50-mm), 9-gage, galvanized steel, chain-link fabric fencing; minimum 8 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.
   a. The concrete base dimensions shall not exceed approximately 12” into the public egress.
   b. Concrete bases shall be utilized to avoid damaging the existing water proofing of the podium (plaza). However provide concrete bases that provide the equivalent to a typical fixed fencing post, by increasing the weight and/or size.
   c. Provide gates sizes and quantities to equal in quantity and width to each corresponding Exit Door(s) displaced. Gate shall serve as a means of emergency egress to displace the temporary loss of the existing exit(s) providing egress into the fenced area. Gate should be manned by Owner authorized personnel.
3. Coordinate locations with Owner and Architect in advance of purchasing.

D. **Ramp (Bid Alternate No. 2 – Exhibition Hall Lobby):** Provide a portable temporary ramp (including landings, handrails and modular to suit per drawings) if the existing ramp is not accessible for each Event. Shall fully comply with ADA (2009 ICC/ANSI A117.1). Shall require inspection by the local authorities having jurisdiction.

E. Coordination Submittals and Meetings: Coordinate with Owner, Owner's building representatives and the Architect for proposed layouts and schedules. Provide as many meetings and Submittals (including Drawings and Product Data) as necessary for Owner and Architect for approval of any and each temporary facilities used for Owner Events. Where required, submit approved Submittals to the Local Authorities Having Jurisdiction as indicated by the Owner.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Toilets: Use of Owner's existing toilet facilities will **not** be permitted.
2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.

3. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
4. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
   a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
5. Drinking-Water: Bottled-water, drinking-water unit dispensers.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
1. Maintain a minimum temperature of 50 deg F in permanently enclosed portions of building for normal construction activities.
2. Provide measures and equipment to meet warranty requirements of interior woodwork, specified in Division 6 and 12 Sections.

F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
   a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
   b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction and continuing until removal of temporary partitions is complete.
2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

G. Ventilation and Humidity Control: Temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
1. Provide measures and equipment to meet warranty requirements of interior woodwork, specified in Division 6 and 12 Sections.

H. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner. Shall not conflict with Owner Event's power requirements.

I. Electric Power Service: Electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Connect temporary service to Owner's existing power source, where acceptable to the Owner and if does not conflict with Owner Event's power requirements.
2. Provide any remaining separate power, if Owner on-site power is not of sufficient characteristic, size and capacity and for the construction operations.

J. Lighting: Temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. If permanent lighting is not available at time of installation of interior finishes, provide temporary lighting that simulates permanent lighting conditions during installation of interior finishes.
3. Existing building has perimeter outdoor flood lights used only for Owner's Event and other Owner operations and shall not be used for the Work.

K. Telephone/Cable Service: Temporary telephone service in common-use facilities for use by all construction personnel. Install separate telephone line(s) for each field office.

1. Provide additional telephone or cable lines for the following:
   a. Provide a dedicated telephone or cable line for each computer in each field office to suit internet service provided. A minimum of three separate dedicated lines are required.
   b. Provide a dedicated telephone line for each facsimile machine in each field office. A minimum of two separate dedicated lines are required.
2. At each telephone, post a list of important telephone numbers.
   a. Police and fire departments.
   b. Ambulance service.
   c. Contractor's home office.
   d. Architect's office.
   e. Engineers' offices.
   f. Owner's office.
   g. Principal subcontractors' field and home offices.
   h. Owner's building manager representative(s).
   i. Any others per Owner.
3. Provide cellular telephone or portable two-way radio for use by superintendent when away from field office.

L. Electronic Communication Service: Temporary electronic communication service, including electronic mail, in common-use facilities.

1. Provide PC systems, high speed 11"x17" b/w & color printer/scanner with document feeder and service with ISP. Provide Intel Pentium D or Intel Core Duo, 3.0 GHZ processing speed or better processor or equivalent, 4 GB RAM minimum, Windows operating system, and current edition of Internet Explorer. Shall be primarily for the Contractor use for the Work.
2. Provide an additional large color flat panel display to show primarily 30"x42" full size drawings primarily for Contractor use for the Work.

3. Provide broadband internet access as available in Project location. Service shall provide no less than approximately an average of 100 Mbps upload and download speed for the user when tested under actual working conditions and taking into account any sharing of limited bandwidth.
   a. Provide wireless internet connectivity for mobile devices for Contractor, Owner, Architect, Engineer and any other authorized personnel per the Owner.
   b. Provide equivalent high speed wireless Internet connectivity for Owner and Architect access.
4. Architect will establish and maintain a separate website related to this Project and provide access code to Owner and Contractor as established at Pre-construction conference.

M. Site Webcam:
1. Install site webcam as directed by the Owner.
2. Set up as directed by the Owner.
3. Maintain Internet link for use by Owner's preferred websites.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines. Comply with NFPA 241.
2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
3. Establish a smoking area outside and 25 ft away from building openings for construction personnel since smoking within the building will not be permitted.

B. Temporary Construction Entrance: Construct and maintain construction entrances adequate for construction operations. Locate temporary construction entrances as indicated on Drawings.

C. Traffic Controls: Temporary traffic controls at junction of temporary roads with public roads. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.
3. Refer to Division 1 section "Summary", for temporary road closures.

D. Parking: Refer to Division 1 section "Summary", for parking restrictions.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

F. Project Identification and Temporary Signs: Project identification signs are part of the Contract. Comply with layout and details indicated on Drawings. Submit proposed sign for Owner

approval. Install signs in location(s) to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.

1. Provide temporary, directional signs for construction personnel and visitors.
2. Maintain and touchup signs so they are legible at all times.

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section "Summary" for progress cleaning requirements.

H. Existing Elevator Use: Use of Owner's existing elevators will **not** be permitted.

I. Temporary Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

J. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

K. Existing Stair Usage: Use of Owner's existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.

L. Temporary Use of Permanent Stairs: Cover finished permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

M. Existing Ramp Usage: Use of Owner's existing ramps will be permitted, as long as ramps are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect ramps and to maintain means of egress. If, despite such protection, ramps become damaged, restore damaged areas so no evidence remains of correction work.

N. Temporary Ramps: Shall comply per ADA ICC/ANSI 117.1.

1. Provide temporary ramps, landings and hand rails if sequencing of the work does not allow completion and temporary occupancy of the room for Owner Events (Bid Alternate No.2 Exhibition Hall Lobby).
2. Provide as approved per the local authority having jurisdiction, if ramps are constructed from FRT wood or non-combustible prefabricated metal systems.

O. Temporary Vehicular Ramps: If required, provide temporary vehicular ramps.

1. Provide temporary signage, fencing, and gates to prohibit non-Work related usage, when in place but not in service.
2. At Substantial Completion, restore floor and walls to condition existing before initial use. Do not reduce existing public sidewalks.
3. Coordinate with Owner and Architect for proposed locations. Its location shall also be approved per the local authorities having jurisdiction.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Division 1 Section "Summary."

C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

D. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

E. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As indicated on Drawings.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with 3 sets of keys.

F. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Provide any additional worker exits as required per the local authority having jurisdiction. Provide gates sized as necessary for the Work.

G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

H. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

I. Covered Walkway: Erect structurally adequate, protective, covered walkway for passage of individuals along adjacent public street(s). Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.

1. Construct covered walkways using scaffold or shoring framing.
2. Provide wood-plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
3. Extend back wall beyond the structure to complete enclosure fence.
4. Paint and maintain in a manner approved by Owner and Architect.

J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
2. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer licensed in Virginia and responsible for their preparation.
   a. Provide delegated design submittal for the approximately 41 foot tall temporary enclosure walls behind the existing curtain wall to be demolished. Refer to Architectural Demolition and Sequencing Drawings.
   b. Combustible materials such as lumber for any temporary structural framing, maybe acceptable if approved per the local authority having jurisdiction. Otherwise, provide non-combustible metal temporary structural framing (including but not limited by scaffolding or shoring framing).
3. Temporary structural loads:
   a. Either comply per structural design loads (wind, lateral) per General Notes on S0.1 drawing or ASCE 37 (alternate design loads during construction and temporary structures).
4. Provide thermal insulation, especially due to Owner Event's that utilizes the ice rink (Hockey and Ice Shows) and the loss of existing mechanical floor heating and cooling grilles at the curtain wall.
   a. Minimum 6" thick mineral wool insulation.
5. Do not disturb existing conditions containing asbestos. Notify Owner if is necessary to disturb.
6. Insulate partitions to provide noise protection to occupied areas.
7. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
8. Protect air-handling equipment.
9. Weather strip openings.
10. Provide walk-off mats at each entrance through temporary partition.
11. Provide doors in temporary enclosures where needed for egress, to the satisfaction of the local authority having jurisdiction.
12. Provide continuous membrane water barriers along temporary enclosure roofing and walls and fully adhere to adjacent existing water tight construction.
13. Upon removal, patch all existing surfaces.

K. Temporary Partitions: Floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.

1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
2. Construct dustproof partitions with 2 layers of 3-mil (0.07-mm) polyethylene sheet on each side. Cover floor with 2 layers of 3-mil (0.07-mm) polyethylene sheet, extending

sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.

a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.

3. Insulate partitions to provide noise protection to occupied areas.
4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
5. Protect air-handling equipment.
6. Weather strip openings.
7. Provide walk-off mats at each entrance through temporary partition.
8. Provide doors in temporary partitions where needed for egress, to the satisfaction of the local authority having jurisdiction.
9. Do not disturb existing conditions containing asbestos. Notify Owner if is necessary to disturb.
10. Upon removal, patch all existing surfaces.

L. Temporary Partitions and Enclosure Walls (reusable & portable types):

1. Shall be a Contractor option but not in lieu of the performance criteria specified for both Temporary Partitions per paragraph 3.4 J and Enclosure Walls per paragraph 3.4 K.
2. Install per manufacturer's recommendations and requirements.
3. Upon removal, patch all existing surfaces.

M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with "FIRE EXTINGUISHER" sign mounted above.
   a. Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
   b. Locate fire extinguishers where convenient and effective for their intended purpose. Provide not less than one extinguisher for each floor, at or near each usable stair.
2. Store combustible materials in containers in fire-safe locations.
3. Prohibit smoking in hazardous fire-exposure and construction areas.
4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
5. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
6. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

7. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting.

N. Protect existing HVAC equipment from intrusion of dust, dirt and debris during alteration construction operations.

1. Protect new and existing inactive ductwork during construction operations. Cap ends with 6-mil (0.14-mm) polyethylene sheet during construction to prevent contamination.
2. Subject to Owner approval, install filter media having a MERV of at least 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction. A complete set of temporary filters must be installed prior to and at the completion of the temporary use of the system(s). Change filters every two weeks of system(s) temporary operation or as directed by the Architect and/or Owner due to building environmental conditions. The filters to be utilized during the temporary operation shall be the same size as specified for permanent operation. Wrapping of equipment with filter media will not be permitted
3. The Architect must observe and approve the conditions of the building before temporary filters are removed at Substantial Completion.
4. Testing and balancing shall not be performed when dust, dirt or debris- generating activities are occurring.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard, replace, or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
    a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
    b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
    c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section “Closeout Procedures.”

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and equivalent products.

B. Related Sections:
   1. Division 01 Section “Substitution Procedures” for requests for substitutions.
   2. Division 01 Section “References” for applicable industry standards for products specified.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term “product” includes the terms “material,” “equipment,” “system,” and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Equivalent Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that are equivalent to or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words “basis-of-design product,” including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating equivalent products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

A. Equivalent Product Requests: Submit request for consideration of each equivalent product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Equivalent Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of an equivalent product request. Architect will notify Contractor of approval or rejection of proposed equivalent product request.
   a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
   b. Use product specified if Architect does not issue a decision on use of an equivalent product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces, if any. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section “Closeout Procedures.”

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term “as selected,” Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Equivalent products or substitutions for Contractor's convenience will not be considered.

2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Equivalent products or substitutions for Contractor's convenience will not be considered.
3. Products:
   a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Equivalent products or substitutions for Contractor's convenience will not be considered.
   b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Equivalent Products" Article for consideration of an unnamed product.
4. Manufacturers:
   a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
   b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Equivalent Products" Article for consideration of an unnamed manufacturer's product.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or an equivalent product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Equivalent Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
   1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 EQUIVALENT PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for equivalent product when all of the following conditions are satisfied. If the following conditions are not

satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

B. Comply per 3.14.1 thru 3.14.2 Cutting and Patching, 3.14.3 Underground Utility Damage Prevention Act, 3.15.1 thru 3.15.2 Cleaning Up under A201 General Conditions of the Contract for Construction As Modified. Following shall not supercede the General Conditions.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

C. Cutting and Patching Plan: Submit plan describing procedures at least **10** days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.

3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate how long services and systems will be disrupted.

D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

E. Certified Surveys: Submit **two** copies signed by land surveyor.

F. Final Property Survey: Submit **two** copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from the Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include, but are not limited to, the following:

a. Primary operational systems and equipment.
b. Fire separation assemblies.
c. Air or smoke barriers.
d. Fire-suppression systems.
e. Mechanical systems piping and ducts.
f. Control systems.
g. Communication systems.
h. Conveying systems.
i. Electrical wiring systems.
j. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include, but are not limited to, the following:

a. Water, moisture, or vapor barriers.
b. Membranes and flashings.
c. Exterior curtain-wall construction.
d. Equipment supports.
e. Piping, ductwork, vessels, and equipment.
f. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
   a. Restrict cutting and patching of existing brick masonry indicated to remain to areas and methods approved by Architect.

C. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

D. Manufacturer's Installation Instructions: Comply with manufacturer's current printed and published (written) instructions and recommendations for storing and installing products and equipment in applications indicated. Maintain copies on-site.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate

and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   a. Description of the Work.
   b. List of detrimental conditions, including substrates.
   c. List of unacceptable installation tolerances.
   d. Recommended corrections.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of **two** permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

J. Alignment With Existing Construction: Align finish faces of infill and abutting construction with adjacent faces of existing construction unless indicated otherwise. Where such work is shown to be a different thickness from existing construction, align to the corridor or most public side unless indicated otherwise.

3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Temporary Support: Provide temporary support of work to be cut.

C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements of Division 01 Section "Summary."

E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

a. Do not cut existing structural reinforcement (i.e. rebars) unless indicated otherwise per Structural Drawings.

4. Masonry: Remove existing brick in whole units using hand tools. Minimize disturbance of existing masonry indicated to remain.
5. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
6. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
7. Proceed with patching after construction operations requiring cutting are complete.

G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
   a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
   b. Restore damaged pipe covering to its original condition.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
6. Exterior Podium (Plaza): Patch components in a manner that restores enclosure to a weathertight condition just prior to the start of the Work.

H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.

2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

a. Utilize containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section " Testing, Adjusting and Balancing

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures.
   2. Final completion procedures.
   3. Warranties.
   4. Final cleaning.
   5. Repair of the Work.

B. Related Requirements:
   1. Section 017300 “Execution” for progress cleaning of Project site.
   2. Section 017823 “Operation and Maintenance Data” for operation and maintenance manual requirements.
   3. Section 017839 “Project Record Documents” for submitting record Drawings, record Specifications, and record Product Data.
   4. Section 017900 “Demonstration and Training” for requirements for instructing Owner's personnel.

1.3 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 ABOVE-CEILING WORK:

A. Complete above-ceiling work prior to installation of finish ceilings. Coordinate with the Owner's third-party contractors, such as data network and security systems, if any.

B. Complete or correct deficiencies, if any, noted by Architect, Owner and local authorities having jurisdiction or confirm with Architect that any such deficiencies may be completed or corrected at a later date without obstructing installation of ceilings.

C. Coordinate with local authorities having jurisdiction to obtain required above-ceiling reviews. Complete or correct above-ceiling work to comply with directives issued by the reviewing authorities. Upon completion or correction, certify in writing that all the items cited by reviewing authority have been completed or corrected and submit copies to the local authority, Owner, and Architect.

D. Following completion of Items A, B and C above, the ceiling may be "enclosed." Coordinate installation of acoustical ceiling hold-down clips, if any, with late stage activities such as HVAC testing and balancing and data network testing.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete. Substantial Completion shall be for entire scope of Work unless Owner has previously agreed to an alternative arrangement.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.

3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.

a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain signature of Owner's agent for receipt of submittals.

5. Submit test/adjust/balance records.

6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment. Demonstrate that air and water systems are balanced and that automatic temperature control system is in control of all equipment as indicated. This may require separate demonstrations if controls cannot be tested for applicable seasons of the year.
4. Submit written certification that all special inspections have been completed.
5. Submit written certification that all Building Commissioning has been completed, and as required by the appropriate Sections.
6. Submit written certification that testing/adjusting/balancing operations have been completed, and that systems are operational and under control in conformance with requirements of Division 1.
7. Complete testing of the electronic security [and related detention] equipment demonstrating security control.
8. Perform preventive maintenance on equipment used prior to Substantial Completion.
9. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 “Demonstration and Training.”
10. Advise Owner of changeover in heat and other utilities.
11. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
12. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.8 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.9 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding interior in numbered order of Architect's finish schedule.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
   a. Project name.
   b. Date.
   c. Name of Architect
   d. Name of Contractor.
   e. Page number.
4. Submit list of incomplete items in the following format:
   a. MS Excel electronic file. Architect will return annotated file.

1.10 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.

e. Remove snow and ice to provide safe access to building.

f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

h. Sweep concrete floors broom clean in unoccupied spaces.

i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

k. Remove labels that are not permanent.

l. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grilles.

o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.

p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.

q. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 015000 “Temporary Facilities and Controls.” Prepare written report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 “Temporary Facilities and Controls.”

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
    a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Product maintenance manuals.
5. Systems and equipment maintenance manuals.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
   a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
   b. Enable inserted reviewer comments on draft submittals.
2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, “Preparation of Operating and Maintenance Documentation for Building Systems.”

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.

7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
   a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
   b. Provide separate Operation and Maintenance Manuals for each Phase. For Phases beyond Phase 1, the index must list all data required but, subject to agreement of Owner and Architect, the manual may reference materials included in the Phase 1 manual and need not duplicate them. Warranty data for each Phase must be included in the manual for that Phase.
   c. Identify each binder on front and spine, with printed title “OPERATION AND MAINTENANCE MANUAL,” Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
   1. Type of emergency.
   2. Emergency instructions.
   3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
   1. Fire.
   2. Flood.
   3. Gas leak.
   4. Water leak.
   5. Power failure.
   6. Water outage.
   7. System, subsystem, or equipment failure.
   8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
   1. Instructions on stopping.
   2. Shutdown instructions for each type of emergency.
   3. Operating instructions for conditions outside normal operating limits.
   4. Required sequences for electric or electronic systems.
   5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference

Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   4. Material and chemical composition.
   5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
   1. Inspection procedures.
   2. Types of cleaning agents to be used and methods of cleaning.
   3. List of cleaning agents and methods of cleaning detrimental to product.
   4. Schedule for routine cleaning and maintenance.
   5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
   1. Standard maintenance instructions and bulletins.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.

5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
   1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
   2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
   1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
   2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."

G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.
   4. Miscellaneous record submittals.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Submit color annotated PDF electronic files equivalent to scanned record prints in lieu of the physical prints.

B. Record Specifications: Marked-up Specifications, including addenda and contract modifications.
   1. Submit color annotated PDF electronic files equivalent to scanned record prints in lieu of the physical prints.

C. Record Product Data: Mark Product Data to indicate the actual product installation.
   1. Submit color annotated PDF electronic files equivalent to scanned record prints in lieu of the physical prints.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities.
   1. Submit color annotated PDF electronic files equivalent to scanned record prints in lieu of the physical prints.

E. Deliver record drawings to Architect for Architect's preparation of Record Drawings in accordance with the General Conditions.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper and electronic copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Field Clarifications, RFI's, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify each Record Drawing and organize into sets.

1. Record Prints (Required, only if electronic annotated PDF is not possible; notify Architect in advance): Organize record prints and newly prepared record Drawings into

manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Electronic Format: Annotated PDF electronic file.
   a. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
3. Identification: As follows:
   a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS" in a prominent location.
   d. Name of Architect.
   e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Note related Change Orders and record Drawings where applicable.

B. Format: Submit record Specifications as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of marked-up miscellaneous record submittals.
   1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
   1. Demonstration of operation of systems, subsystems, and equipment.
   2. Training in operation and maintenance of systems, subsystems, and equipment.
   3. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
   1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
   1. Identification: On each copy, provide an applied label with the following information:
      a. Name of Project.
      b. Name and address of videographer.
      c. Name of Architect.
      d. Name of Construction Manager.
      e. Name of Contractor.
      f. Date of video recording.
   2. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals or in PDF electronic file format on compact disc.

1.5 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section “Quality Requirements,” experienced in operation and maintenance procedures and training.

B. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

1.6 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Documentation: Review the following items in detail:
   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project record documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.
2. Emergencies: Include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.
3. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.

g. Instructions on stopping.
h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

4. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
5. Troubleshooting: Include the following where indicated in individual Sections:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
6. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
7. Repairs: Include the following where indicated in individual Sections:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section “Operation and Maintenance Data.”

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Owner will furnish a representative to describe Owner's operational philosophy.
   2. Owner will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, with at least seven days' advance notice.

C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using operation and maintenance data submittals. Do not schedule demonstrations of Division 21, 22, 23, 25 and 26 systems and equipment until associated testing, adjusting and balancing has been completed and approved.

D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video: Provide minimum 640 x 480 video resolution converted to format file type acceptable to Owner, on electronic media.

1. Electronic Media: Read-only format compact disc acceptable to Owner, with commercial-grade graphic label.
2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
   a. Name of Contractor/Installer.
   b. Business address.
   c. Business phone number.
   d. Point of contact.
   e. E-mail address.

C. Audio Levels: Verify audio pickup is sufficient for clear understanding. Utilize microphones where necessary. Repeat training where audio is unintelligible.

D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.

1. Furnish additional portable lighting as required.

E. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

SECTION 018316 – NFPA 285 EXTERIOR WALL ASSEMBLY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for providing exterior wall assemblies demonstrably in compliance with NFPA 285 testing requirements. Therefore, the General Contractor shall be responsible for ensuring all exterior wall assemblies are in compliance with NFPA 285 if the Contractor proposes any exterior wall component not otherwise specified/indicated as part of the basis-of-design or comparable assemblies for this Project.

B. NFPA 285 is an exterior wall assembly test (not a component test) specific to the component(s) tested and reported as part of that assembly. Therefore, compliance with NFPA 285 is required FOR ALL EXTERIOR WALL ASSEMBLIES, and documentation of compliant assemblies including all of the assembly's components is required to demonstrate compliance with the code requirements.

1. Substituting any alternate exterior wall component is not acceptable without pre-approval from the authorities having jurisdiction, or documentation demonstrating a passing assembly test with the proposed substituted product(s).

   a. For example, if a substitution is submitted to revise the specified (basis of design) cavity insulation (or air barrier, or any other exterior wall component), said substituted cavity insulation must have been tested (and passed) in combination with all of the other exterior wall components.

2. NFPA 285 is not a component test, so documentation claiming said component is "NFPA 285 compliant" shall not be acceptable, unless it can be demonstrated that said component is acceptable with the other required and provided exterior wall components.

C. Exterior wall assemblies that must comply with NFPA 285 include those containing the following combustible components:

1. Any foam plastic insulation, such as polystyrene, polyisocyanurate, and polyurethane foams. This includes cavity insulation, insulation installed within studs, and/or exterior insulation and finish systems (EIFS).
2. Any combustible water-resistive barrier installed over 40 feet above the finish grade, such as felts, building wrap, and membrane or fluid-applied air barriers.
3. Fiber-reinforced polymer (FRP) cladding without fireblocking, in excess of area limitations, or otherwise not meeting limitations or exceptions imposed by applicable building code.

4. High-pressure decorative exterior-grade compact laminate (HPL) cladding installed over 40 feet above the finish grade or otherwise not meeting limitations imposed by the applicable building code.
5. Metal composite material (MCM) cladding installed over 40 feet above the finish grade or otherwise not meeting limitations imposed by applicable building code.

1.3 DEFINITIONS

A. Exterior Wall Assembly: For NFPA 285 compliance purposes, the exterior wall assembly is one that encloses interior spaces and does not include parapets, exterior "wing" walls, or site-related walls (e.g., retaining walls or screen walls).

B. Basis-of-Design: For NFPA 285 compliance purposes, all exterior wall assemblies indicated in the Contract Documents shall be considered compliant, including specific basis-of-design components. Such basis-of-design assemblies are to establish a compliant NFPA 285 design and do not limit use of other acceptable manufacturers' comparable tested assemblies with comparable tested components.

C. Comparable: For NFPA 285 compliance purposes, comparable assemblies, including specific comparable components, may be allowed. Such comparable components are meant to allow for alternative compliant NFPA 285 designs.

D. Exterior Wall Assembly Component(s): Products which are a part of an exterior wall assembly, including, but may not be limited to: each type of veneer, foam plastic insulation, water-resistive barriers, air barriers, sheathing, flashings, blocking, lintels, and substrate construction (e.g., masonry and steel studs).

1.4 PERFORMANCE REQUIREMENTS

A. Exterior Wall Assemblies: Shall comply with applicable "NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components."

1. Although the title of the applicable test includes the text "Nonload-bearing," and the standard itself may include assembly descriptions such as curtain wall assemblies, be advised that the NFPA 285 test requirements apply to every exterior wall assembly on this Project.

1.5 ACTION SUBMITTALS

A. Comparable NFPA 285 Exterior Wall Assemblies: Submit request for consideration for each proposed comparable exterior wall assembly or exterior wall assembly component. Identify each component required and, where there are options (e.g., documentation may indicate something like, "any gypsum wallboard at least 1/2 inch thick), each optional component proposed. Provide cross-reference to the basis-of-design assembly for each comparable assembly/component proposed to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Provide Research Report, Technical Evaluation Report, Material Test Report, engineering judgment, or other published data acceptable to authorities having jurisdiction to demonstrate proposed comparable exterior wall assembly (including all of the exterior wall components to be provided on this Project) has been tested or evaluated to comply with the NFPA 285 test requirement.

B. Substitution Exterior Wall Assembly Component Requests: Submit request for consideration of each proposed substituted product. Identify any and all products to be substituted. Include Specification Section number and title and Drawing numbers and titles.

1. Provide Research Report, Technical Evaluation Report, Material Test Report, engineering judgment, or other published data acceptable to authorities having jurisdiction to demonstrate proposed comparable exterior wall assembly (including all of the exterior wall components to be provided on this Project) has been tested or evaluated to comply with the NFPA 285 test requirement.

2. Include approval of authorities having jurisdiction for the substitution. Obtain approval from the authorities having jurisdiction PRIOR TO SUBMITTING SUBSTITUTION for consideration by the Architect.

1.6 INFORMATIONAL SUBMITTAL

A. Basis-of-Design NFPA 285 Exterior Wall Assemblies: If the assembly(ies) to be provided on this Project are identical to the basis-of-design, in every way (components and detailing), "Action Submittals" shall not be required and only a certification from the Contractor or other acceptable documentation indicating compliance is required. Identify each component product for the record.

1.7 GENERAL CONTRACTOR RESPONSIBILITIES

A. Coordinate affected trades and construction to ensure compliance with the basis-of-design exterior wall assembly or documented NFPA 285 testing.

B. Provide quality assurance procedures, testing and verification as required.

C. If the basis-of-design, approved comparable, or approved substitution assemblies are not provided, submit the proposed alternative exterior wall assembly and component(s) for NFPA 285 testing,

1. Upon obtaining a passing NFPA 285 test, submit supporting documentation in accordance with "Action Submittals" herein.

2. Provide testing sufficiently in advance of operations and construction schedule as to not delay the Project (such tests have been known to take anywhere between 3-6 months to schedule and conduct).
3. If such testing fails, continue additional testing until such time the proposed alternative exterior wall assembly(ies) achieves a PASSING grade.

D. If the basis-of-design, approved comparable, or approved substitution assemblies are not provided, organize preconstruction meetings between the trades involved in the exterior wall assembly to discuss the implications of not providing the basis-of-design or approved comparable components and how compliant components will ultimately be incorporated into the exterior wall assembly, or to determine if testing will be required.

PART 2 - PRODUCTS

(not used)

PART 3 - EXECUTION

3.1 EXTERIOR WALL ASSEMBLY PRE-CONSTRUCTION CONFERENCE

A. Review preliminary pre-construction checklists and guide included at the end of this Section for additional requirements if the basis-of-design, approved comparable, or approved substitution assemblies are not provided.

END OF SECTION 018316

EXTERIOR WALL ASSEMBLY PRE-CONSTRUCTION CONFERENCE GUIDE

If the basis-of-design, approved comparable, or approved substitution exterior wall assemblies are not provided, such exterior wall components will require the coordinated efforts of all of the exterior wall trades on the construction, design, and ultimate NFPA 285-compliant exterior wall assemblies of such components. If a NFPA 285 test is required (or multiple tests are required because of failing tests), such testing of the proposed exterior wall assembly will be costly and time-consuming.

Therefore, the Contractor and affected exterior wall subcontractors must have a working knowledge of the NFPA 285 test and must work toward a common goal of achieving a compliant assembly.

Contractor may request an electronic version of this document for editing purposes and for its use.

Send a copy of this guide to the affected trades and/or attendees so they can attend the Conference prepared to discuss these topics and to fill in as much of this information as possible prior to the conference, or be prepared to fill them in at the conference.

Checklist:

Submit and/or complete the following prior to conducting the Pre-Construction Conference. Confirm any additional submittal requirements with the relevant specification sections. Check those items below that you have completed or received "Approved" submittals from the Architect. Delete those that do not apply.

☐ Product data ☐ Shop drawings ☐ Product Certificates

☐ Product test reports ☐ Installer qualifications ☐ Compatibility docs

☐ _____

Moseley Architects Project No. 521650

Mandatory Attendees:

Attendance by the following parties and affected trades is mandatory. Identify and ensure any other trades or parties involved or affected by the installation of the exterior wall assembly components are also present. Check those below who actually attend the meeting. Delete those that do not apply.

☐ Owner and/or Owner's representative ☐ Architect

☐ Contractor ☐ Air barrier installer / subcontractor

☐ Exterior Foam Plastic Insulation subcontractor (cavity, stud, and/or EIFS)

☐ Exterior Metal Panel (MCM) subcontractor ☐ Waterproofing subcontractor

☐ FRP subcontractor ☐ HPL subcontractor

☐ _____ ☐ _____

Review of relevant Project Contract Specification Sections:

Review the Contract Specifications and identify and note any products that may be necessary for compliance, so all parties understand what is required of them. Submit any substitutions in accordance with these Documents. Please note: Not all affected specification sections are indicated below – edit as necessary.

Spec Section	Products (if any)
018316	
042000	
071113	
071326	
071413	
071416	
07241X	
072500	
072726	
072727	
074213	

Review of relevant Project Contract Drawings:

Review the Contract Drawings and identify and note any products that may be necessary for compliance, so all parties understand what is required of them. Submit any substitutions in accordance with these Documents.

Project Contract Drawing or Detail Number	Products (if any)

Moseley Architects Project No. 521650

Review of relevant Project Shop / Submittal Drawings:

Review the Contract Drawings and identify and note any products that may be necessary for compliance, so all parties understand what is required of them. Resubmit those submittals that have not been approved by the Architect.

Project Submittal / Shop Drawing Reference	Products (if any)

Review of Components / Products:

Review and identify the components that will actually be provided on this Project. Delete those that do not apply.

Component	Actual Component to be provided for Project
Foam Plastic Insulation – field of wall	
Foam Plastic Insulation – cavity	
Foam Plastic Insulation – studs	
Foam Plastic Insulation (wall) – voids / cracks / shims	
Fluid-applied membrane – Permeable - wall	
Fluid-applied membrane – Impermeable -wall	
Self-adhered membrane – Permeable - wall	
Self-adhered membrane – Impermeable -wall	
Transition membrane – self-adhered	
Primer	
Mastic / Termination sealant	
MCM – wall	
HPL – wall	
FRP - wall	

Other considerations or comments:

_____ _____

_____ _____

_____ _____

_____ _____

SECTION 018317 – EXTERIOR ENCLOSURE AIR BARRIER REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. This section includes administrative and procedural requirements for accomplishing an airtight building enclosure that controls infiltration or exfiltration of air.

1. The airtight components of the building enclosure and the joints, junctures and transitions between materials, products, and assemblies forming the air-tightness of the building enclosure are called “the air barrier system.”
2. Requirements include coordination between the trades, proper scheduling and sequencing of the Work, preconstruction meetings, inspections, tests, and related actions,
3. Reports performed by Contractor, independent agencies, and governing authorities.
4. Construct the building enclosure with a continuous air barrier system to control air leakage into, or out of conditioned spaces. The air barrier system shall have the following characteristics:
   a. Continuous, with all joints sealed.
   b. Structurally supported to withstand positive and negative air pressures applied to the building enclosure.
   c. Connections between:
      1) Elevated plaza slab and walls.
      2) Walls and sloped glazing system, storefront doors.
      3) Walls and exterior soffits.
      4) Walls and gutters.
      5) Walls and floor control and expansion joints.
5. Make all penetrations of the air barrier and paths of air infiltration / exfiltration air-tight.

B. Air barrier manufacturer’s technical representative shall review installation to verify compliance with requirements. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.

C. Coordinate subcontractors to provide an airtight building enclosure.

1. Continuity of the air barrier materials and products with joints to provide assemblies.
2. Continuity of all exterior enclosure assemblies with joints and transition materials.
3. Specific quality-control requirements for individual construction activities are indicated in other sections of the specifications. Ensure each subcontractor is adequately and satisfactorily performing the quality assurance documentation, tests and procedures required by each section.
4. Inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.

5. Requirements to provide an airtight building enclosure is not limited by quality-control services performed by Architect, Owner, or authorities having jurisdiction and are not limited by provisions of this section.

1.3 RESPONSIBILITIES

A. Contractor responsibilities:

1. Coordinate affected trades and sequence construction to ensure continuity of the air barrier system joints, junctures, and transitions between materials and assemblies of materials and products, from substructure to walls to roof.
   a. Coordinate the sequence of activities to accommodate required services with a minimum of delay.
   b. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
   c. Schedule times for inspections, tests, taking samples, and similar activities.
2. Provide quality assurance procedures, testing and verification as required.
3. Organize preconstruction meetings between the trades involved in the whole building's air barrier system to discuss where each trade begins and ends and the responsibility and sequence of installation of all the air-tight joints, junctures, and transitions between materials, products and assemblies of products specified in the different sections, to be installed by the different trades.
4. Provide mockup of exterior wall assembly as indicated in Division 1 Section "Quality Requirements."

1.4 PERFORMANCE REQUIREMENTS

A. Materials: Used for the air barrier system in the opaque envelope shall have an air permeance not to exceed 0.004 cfm/ft2 under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s.m^2 @ 75 Pa) when tested in accordance with ASTM E 2178. Or,

B. Assemblies of materials and components: shall have an air permeance not to exceed 0.04 cfm/ft2p under a pressure differential of 0.3 in. water (1.57psf) (0.15 L/s.m^2 @ 75 Pa) when tested in accordance with ASTM E 1677.

1.5 QUALITY ASSURANCE

A. Qualifications for Air Barrier Testing and Inspection Agencies: Qualified and specialize in the types of air barrier system inspections and tests to be performed.

PART 2 - PRODUCTS

(not used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Division 1 Section "Execution."

B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.

C. Repair and protect the Work, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION 018317

AIR BARRIER PRE-INSTALLATION CONFERENCE GUIDE

Purpose:

Few building construction components require the coordinated activities of more different players on the construction, design, and management teams than an air barrier system. Once an air barrier has been covered, any remedies for problems with the components or installation can be costly and time-consuming.

Therefore, in an effort to minimize such concerns, you and your subcontractors must have a working knowledge of the air barrier installation, proper sequencing, and must work toward a common goal. Through the use of the integrated mockup panel and this Pre-Installation Conference Guide, gaining such knowledge should be enhanced.

Source: Much of this checklist utilizes content from Tremco's "Air Barrier Project Management – Pre-Construction Meeting Checklist" document.

You may request an electronic version of this document for you to edit and for your use.

Send a copy of this guide to the affected trades and/or attendees so they can come to the Conference prepared to discuss these topics and so you and they can fill in as much of this information as possible prior to the meeting, or be prepared to fill them in at the meeting.

Task Checklist:

Submit and/or complete the following prior to conducting the Pre-Installation Conference. Confirm any additional submittal requirements with the relevant specification sections. Check those items below that you have completed or received "Approved" submittals from the Architect. Delete those that do not apply.

☐	Product data	☐	Shop drawings	☐	Product Certificates
☐	Product test reports	☐	Installer qualifications	☐	Samples
☐	Compatibility docs	☐	Integrated mockup	☐	Quality Assurance Program
☐	ABAA certifications	☐	Warranty sample	☐	_____

☐ ABS Subcontractor reviewed submittals of other indicated/specified trade(s)

Mandatory Attendees:

Attendance by the following parties and affected trades is mandatory. Identify and ensure any other trades or parties involved or affected by the installation of the air barrier components are also present. Check those below who actually attend the meeting. Delete those that do not apply.

- ☐ Owner and/or Owner's representative
- ☐ Owner's Testing Agency (if hired to inspect ABS)
- ☐ Air barrier installer / subcontractor
- ☐ Air barrier manufacturer's technical representative
- ☐ Window opening subcontractor
- ☐ Exterior Insulation subcontractor
- ☐ Exterior Metal Panel subcontractor
- ☐ Steel frame (hollow metal) subcontractor
- ☐ _____
- ☐ Architect
- ☐ Contractor
- ☐ Masonry subcontractor
- ☐ Roofing subcontractor
- ☐ Sheathing subcontractor
- ☐ Concrete subcontractor
- ☐ CFMF-S subcontractor
- ☐ Waterproofing subcontractor
- ☐ _____

Review of relevant Project Contract Specification Sections:

Review the Contract Specifications and if there are any concerns, identify and note any modifications that may be necessary, so all parties understand what is required of them. Submit any modifications via appropriate supplemental documents (FC or PCO). Edit specification sections to be Project specific.

Spec Section	Modifications (if any)
018317	
072726	
072727	

Review of relevant Project Contract Drawings:

Review the Contract Specifications and if there are any concerns, identify and note any modifications that may be necessary, so all parties understand what is required of them. Submit any modifications via appropriate supplemental documents (FC or PCO).

Project Contract Drawing or Detail Number	Modifications (if any)

Review of relevant Project Shop / Submittal Drawings:

Review the submittals and if there are any concerns, identify and note any modifications that may be necessary, so all parties understand what is required of them. Resubmit those submittals requiring modifications.

Project Submittal / Shop Drawing Reference	Modifications (if any)

Review of Products:

Review the type of air barrier system that will be provided on the Project and identify each component. Delete those that do not apply.

Component	Actual Product to be provided for Project
SPF insulation – field of wall	
SPF insulation (wall) – voids / cracks / shims	
SPF insulation – field of roof	
Fluid-applied membrane – Permeable - wall	
Fluid-applied membrane – Impermeable -wall	
Self-adhered membrane – Permeable - wall	
Self-adhered membrane – Impermeable -wall	
Self-adhered membrane – Permeable - roof	
Self-adhered membrane – Impermeable -roof	
Transition membrane – self-adhered	
Primer	
Mastic / Termination sealant	

Construction tie-in responsibility:

Air barrier systems are successful when a full building envelope/enclosure – without penetrations, voids, holes, gaps, and cracks – is complete. This is critical when numerous trades are involved in the tying-in of the air barrier system to all facets of the building envelope. Utilize the table below to make sure everyone knows who is responsible for the indicated tie-in.

Tie-in Area	Subcontractor responsible for tie-in
Exterior footing to exterior foundation wall	
Exterior foundation to exterior wall	
Slab-on-grade to wall (exterior and interior)	
Slab-on-grade joints	
Slab-on-grade penetrations	
Exterior wall to steel frame/hollow metal (e.g., doors and windows)	
Exterior walls to aluminum frames (e.g., windows and louvers)	
Different exterior wall systems (e.g., masonry to metal)	
Exterior head-of-wall to sloping roof	
Parapet walls to roof	
Exterior wall joints	
Exterior shelf angles	
Exterior steel lintels	
Exterior wall penetrations (e.g., pipes, ducts)	
Roof penetrations	
Roof perimeter	

Compatibility review:

Each trade/installer shall identify materials that may have potential compatibility issues. For example, some membranes may be subject to decomposing when placed in contact with other materials or components, especially sealants and primers; or may deteriorate if left exposed to the elements and are not protected. Delete those trades/installers that do not apply to this Project.

Trade / Installer	Issues / Resolutions
Air barrier	
Window	
Steel frame (hollow metal)	
CFMF-S	
Exterior Metal Panels	
Waterproofing	
Masonry	
Roofing	
Sheathing	
Concrete	
Insulation	
Flexible Flashing	
Metal Flashing	
Structural steel	

Substrate primer considerations:

Indicate whether the substrate for the air barrier material requires the use of a primer, and if so, identify the actual product to be used on the Project. Delete those that do not apply.

Substrate	Yes	No	Product
CMU			
Sheathing			
Concrete			
Precast			
Metal Panels			
Roof substrate board			
Flexible Flashing			
Metal Flashing			
Waterproofing			
Steel frame / hollow metal			
Structural steel			

Substrate preparation considerations:

Indicate whether the substrate for the air barrier material requires special treatment or preparation (e.g., flush joints in CMU), and if so, identify the method to be used on the Project. Delete those that do not apply.

Substrate	Yes	No	Method / Procedure	Subcontractor responsible
CMU				
Sheathing				
Concrete				
Precast				
Metal Panels				
Roof substrate board				
Window frames				
Flexible Flashing				
Metal Flashing				
Waterproofing				
Steel frame / hollow metal				
Structural steel				

Joint considerations:

It may be critical for all joints, gaps, voids, cracks, seams, etc. to be sealed/closed for the air barrier to function properly (based on air barrier manufacturer's instructions). If applicable, indicate the method to be used to close the joints and who is responsible. Delete those that do not apply.

Type of joint	Method used to close joint	Subcontractor responsible
CMU		
Sheathing		
Concrete		
Precast		
Metal Panels		
Roof substrate board		
Window frames		
Steel (hollow metal) frames		
Head-of-wall		
Omitted CMU block		

Installation temperatures:

A major factor in contributing to a successful air barrier system installation is to monitor and install the components within the proper temperature ranges and weather conditions. Indicate below the proper temperature range for each component; the procedure for maintaining the proper temperature range; and the party responsible for maintaining the proper temperature range in accordance with the requirements. Delete those that do not apply.

Component	Proper temperature range	Procedure and Subcontractor responsible
SPF insulation – field of wall		
SPF insulation (wall) – voids / cracks / shims		
SPF insulation – field of roof		
Fluid-applied membrane – Permeable - wall		
Fluid-applied membrane – Impermeable -wall		
Self-adhered membrane – Permeable - wall		
Self-adhered membrane – Impermeable -wall		
Self-adhered membrane – Permeable - roof		
Self-adhered membrane – Impermeable -roof		
Transition membrane – self-adhered		
Primer		
Mastic / Termination sealant		

Air barrier protection:

The air barrier system shall be protected during construction. Indicate below how the components will be protected (method used), by whom, and when. Delete those that do not apply.

Component	Method used for protection	Subcontractor	When
SPF insulation – field of wall			
SPF insulation (wall) – voids / cracks / shims			
SPF insulation – field of roof			
Fluid-applied membrane – Permeable - wall			
Fluid-applied membrane – Impermeable -wall			
Self-adhered membrane – Permeable - wall			
Self-adhered membrane – Impermeable -wall			
Self-adhered membrane – Permeable - roof			
Self-adhered membrane – Impermeable -roof			
Transition membrane – self-adhered			
Primer			
Mastic / Termination sealant			

Air barrier repair:

Discuss how any damage, including but not limited to, accidental holes in the air barrier system, will be repaired – and by whom. Indicate the actual product to be used to perform any repairs in the air barrier components. Delete those that do not apply.

Component	Product to be used for repair	Subcontractor responsible
SPF insulation – field of wall		
SPF insulation (wall) – voids / cracks / shims		
SPF insulation – field of roof		
Fluid-applied membrane – Permeable - wall		
Fluid-applied membrane – Impermeable -wall		
Self-adhered membrane – Permeable - wall		
Self-adhered membrane – Impermeable -wall		
Self-adhered membrane – Permeable - roof		
Self-adhered membrane – Impermeable -roof		
Transition membrane – self-adhered		
Primer		
Mastic / Termination sealant		

Insulation secured to or over air barrier material:

Address any concerns or issues of installing insulation over the air barrier material (foundation, walls, and roof), such as preparation, securing, or fastening methods. Delete those that do not apply.

Insulation type	Method for securement	Concerns (if any)
SPF		
XPS		
Polyiso		
EPS		
EPX		

CFMF-S locations: Delete if they do not apply.

Where CFMF-S is a component in the exterior wall assembly, the air barrier installer may need to mark the material itself to indicate where the framing is located. The insulation subcontractor, in turn (when the insulation is not the air barrier), may need to transfer those marks onto the insulation. If any of the above is required, discuss and identify below. Delete those that do not apply.

Component	Subcontractor responsible for location marks, if necessary
Sheathing	
Air Barrier	
Insulation	

Other considerations or comments:

_____ _____

_____ _____

_____ _____

_____ _____

END OF AIR BARRIER PRE-INSTALLATION CONFERENCE GUIDE

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

C. Remove and Reinstall: Carefully detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 PREDEMOLITION MEETINGS

A. Predemolition Conference: Conduct conference at Project site. Inspect and discuss condition of construction to be selectively demolished.

1. Review structural load limitations of existing structure.
2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
4. Review areas where existing construction is to remain and requires protection.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.

B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for dust control, and for noise control. Indicate proposed locations and construction of barriers.

C. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of stairs.

5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

1. Any items turned over to the Owner shall be accompanied by a transmittal signed by the Contractor and the Owner (the individuals receiving the items shall sign the transmittal). A copy of the transmittal from the Contractor shall be turned over to the Owner's representative for the project. Any items turned over without a transmittal shall be acknowledged as not being received by Owner.

E. Predemolition Digital Photographs and Digital Video-recordings: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit to Owner's representative as part of the submittal package required prior to release of the first request for payment.

1. Prior to mobilization, Owner's representative and Contractor shall together review existing conditions in the construction and mobilization area. The Contractor in the presence of the Owner shall digitally photograph and video-record existing conditions in sufficient detail to record accurately the physical conditions at the start of construction.

2. The Contractor shall provide and the Owner and Contractor shall retain identical digital copies of the documentation.

3. At closeout the Owner's acceptance of the Work includes acceptance of the remaining existing conditions as undamaged by Contractor's forces.

F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.5 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

1. Comply with requirements specified in Division 1 Section "Summary."

2. See " PHASED CONSTRUCTION (SEQUENCING)" phasing requirements in Division 1 Section "Summary."

3. The Owner and Contractor shall establish "staging areas" for temporary storage of furniture and furnishings removed for alteration areas during construction activities. Work areas should be free of furniture and furnishings during construction activities. The Contractor will not be required to work in furnished areas and will not be responsible for the condition of furniture and furnishings left in place without additional compensation.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove loose furniture, furnishings and equipment.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Coordination of Selective Demolition Activities: Coordinate the following with Owner:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Locations of proposed dust- and noise-control temporary partitions and means of egress.
6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
7. Means of protection for items to remain and items in path of waste removal from building.

E. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous materials will be removed by the Owner's separate remediation contractor. Cooperate and coordinate with this separate contractor, and incorporate the separate contractor's work in the Contractor's Construction Schedule, specified in Division 1 Section "Construction Progress Documentation."
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.

F. Storage or sale of removed items or materials on-site is not permitted.

G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Take measures required by OSHA and governing authorities. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
2. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

1. Inventory and record the condition of items to be removed and salvaged or reinstalled. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems which will remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Division 1 Section “Summary.”

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
   a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
   c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
   f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
   g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.

5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
10. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in sections. Unless indicated otherwise per Structural or Architectural Drawings, cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.

1. Do not cut existing structural reinforcement (i.e. rebars) unless indicated otherwise per Structural Drawings.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

1. Remove to suit toothing in new masonry at exposed surfaces, new openings, and where indicated.

C. Concrete elevated slabs and slabs-on-Grade: Unless indicated otherwise per Structural or Architectural Drawings, saw-cut perimeter of area to be demolished, then break up and remove.

1. Do not cut existing structural reinforcement (i.e. rebars) unless indicated otherwise per Structural Drawings.

D. Floor Finishes: After removal of existing floor finishes including backings, remove all residual adhesives and glue. Provide grinding, sanding, or shot-blasting of existing concrete floor slab as required to achieve the proper surface to receive new indicated floor finish. Coordinate slab surface preparations required for each new indicated floor finish with appropriate subcontractor.

E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's “Recommended Work Practices for the Removal of Resilient Floor Coverings.”

F. Curtain Wall: Demolish in sections. Salvage glazing as indicated on drawings. Unless indicated otherwise, remove concealed steel reinforcements. Refer to Architectural drawings for portions to remain, remove or modify. Refer to the Drawings for removal of existing rain leaders concealed within curtain wall. Refer to the Drawings for removal of existing mechanical diffusers concealed within the curtain wall. Coordinate with Sequencing Drawings.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 – BUILDING CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Topping slabs.
2. Beams and other frame members.
3. Walls.

B. Related Sections:

1. Division 01 Section "Special Inspection Services" for administrative and procedural requirements for special inspection services.
2. Division 03 Section "Precast Architectural Concrete" for architectural precast concrete.
3. Division 05 Section "Post-Installed Concrete Anchors" for installing anchors to concrete supports.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 01 Specification Sections.

B. Sustainable Design Submittals: Refer to Division 01 Section "Sustainable Design requirements."

C. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

D. Steel Reinforcement Shop Drawings: Prepare shop drawings in accordance with ACI 315. Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. Include special reinforcement required for openings through concrete structures and dimensioned opening locations. Include applicable dimensions, sections, elevations, and details required to complete installation and coordination of the details, and typical details. Plan shall be drawn at a scale of no less than 1/8" per foot.

E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Architect.

F. Control Joint Layout at Terrazzo Floor Areas: Indicate proposed locations of slab control joints (construction joints and saw-cut contraction joints).

1. Locate construction joints at terrazzo floor areas as indicated, not to exceed ACI-required spacings, and aligned with nearest joint and divider locations indicated on terrazzo floor pattern drawing except as otherwise noted.

G. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Joint-filler strips.
5. Repair materials.
6. Floor and slab treatments.

H. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

I. Heavy Equipment: Existing drawings indicate the existing plaza structure has been designed to support a live load of 100 PSF. Submit calculations, sealed by a Virginia licensed professional engineer, for any heavy equipment proposed to be placed on or operated on the existing plaza structure indicating the existing structure is not overstressed by the equipment.

1. Include the equipment weight and limits of operation in the submittal.

J. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5 and Section 7, "Lightweight Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
3. ACI 318, “Building Code Requirements for Reinforced Concrete.”
4. Concrete Reinforcing Steel Institute (CRSI) “Manual of Standard Practice.”

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. Quality Control at Epoxy Terrazzo Substrates: Contractor shall establish and provide written quality control concrete slab finishing procedures reviewed by and acceptable to the Division 09 Section “Resinous Matrix Terrazzo Flooring” epoxy terrazzo flooring manufacturer for slab areas to receive epoxy terrazzo flooring to maintain the 1/8-inch in 10'-0” tolerance specified. Reduce high spots by approved mechanical means such as shot blast or special grinder. Fill low slab areas with cementitious or epoxy leveling compound acceptable to epoxy terrazzo flooring manufacturer and compatible with epoxy resin to attain level substrate for epoxy terrazzo work. Before concrete slab installation at epoxy terrazzo flooring areas, the Contractor and installer shall review all screed elevations and spacing, extent of slab pour to help assure quality, and

special conditions such as interface to stairs, elevator entrance thresholds and edge of slabs to minimize miscellaneous cracks.

H. Quality Control at Polished Concrete: Contractor shall establish and provide written quality control concrete slab finishing procedures per the Division 03 Section "Polished Concrete Floor Finishing" section, and reviewed by and acceptable to floor finisher for slab areas to receive polished finish.

I. Preinstallation Conference: Conduct conference at Project site.

1. Review concrete design mixtures and examine procedures for ensuring quality of concrete materials.

2. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including, but not limited to, the following:

a. Contractor's superintendent.
b. Ready-mix concrete manufacturer.
c. Concrete subcontractor.
d. Special Inspector
e. Architect
f. Structural Engineer

3. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, shoring procedures, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I/II. Supplement with the following:

a. Fly Ash: ASTM C 618, Class F.
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

C. LIQUID FLOOR TREATMENTS

D. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

1. Available Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Euclid Chemical Company (The); “Euco Diamond Hard.”
   b. L&M Construction Chemicals, Inc.; “Seal Hard.”
   c. Meadows, W. R., Inc.; “Liqui-Hard.”
   d. Metalcrete Industries; “Floorsaver.”
   e. Nox-Crete Products Group, Kinsman Corporation; “Duro-Nox.”

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

2.7 RELATED MATERIALS

A. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

B. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Type IV, for bonding hardened concrete to hardened concrete.

2. Type V, for bonding freshly mixed concrete to hardened concrete.

C. Premolded Joint Material: ASTM D 994- preformed types.

D. Expanded Polystyrene Foam: ASTM C 578, Type I.

2.8 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.9 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used.. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 50 percent.
4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.10 CONCRETE MIXTURES

A. Normal Weight Concrete Toppings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Minimum Cementitious Materials Content: 520 lb/cu. yd.
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content: Do not allow air content of trowel-finished toppings to exceed 3 percent.

B. Light-weight Concrete Toppings: Proportion light-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Minimum Cementitious Materials Content: 520 lb/cu. yd.
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1/2-inch nominal maximum aggregate size.

C. Beams and Other Frame Members: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 4 inches or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.

D. Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 4 inches or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.

2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class D, 1 inch (25mm) tolerances for rough formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces.

1. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Form openings, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beams, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength. Determine potential compressive strength of in-place concrete by testing field-cured specimen's representative of concrete location or members.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring.

B. Plan sequence of removal of shores to avoid damage to concrete.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams and slabs in the middle third of spans.
4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Terrazzo Coordination: Locate construction joints at terrazzo floor areas to align with joint and divider locations indicated on terrazzo floor pattern drawing, as approved.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
2. Indicate the amount of water withheld at the ready-mix concrete batch plant on the concrete batch ticket.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water.
2. Fog-spray forms and steel reinforcement just before placing concrete.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces to receive trowel finish.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view.

2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch.

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Expanded Polystyrene Foam: Provide expanded polystyrene foam where indicated below topping slabs.

3.11 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. per hour before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
   b. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

   a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial

application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.12 LIQUID FLOOR TREATMENT APPLICATION

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than 28 days' old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Terrazzo Coordination: Locate construction joints at terrazzo floor areas to align with joint and divider locations indicated terrazzo floor pattern drawing, as approved.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding

agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 SPECIAL INSPECTIONS

A. Special Inspections and tests shall be performed by the Special Inspector or Special Inspection Agency.

B. Verification and inspection of concrete construction shall be in accordance with Section 1705.3 of VCC 2012 and as follows:

1. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

a. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

1) When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

b. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

c. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

d. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.

e. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

f. Compression Test Specimens: ASTM C 31/C 31M.

1) Cast and laboratory cure two sets of two 6 x 12 standard cylinder specimens or two sets of three 4 x 8 standard cylinder specimens for each composite sample.

g. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of laboratory-cured specimens at 7 days and one set of specimens at 28 days.

1) A compressive-strength test shall be the average compressive strength from a set of specimens obtained from same composite sample and tested at age indicated.

2) Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

h. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

1) Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

i. Additional Tests: Additional tests and Inspections shall be made of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met.

2. Inspections: Perform inspections of the Work to verify compliance with the requirements of the contract documents, including the following:

a. Steel reinforcement placement.
b. Headed bolts and studs.
c. Use of required design mixture.
d. Concrete placement, including conveying and depositing.
e. Curing procedures and maintenance of curing temperature.
f. Concrete batch plant and review procedures for maintaining proper mix proportions and proper mix techniques.
g. Concrete delivery tickets at time of delivery to assure conformance to ACI 318.

C. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Additional testing and inspecting will be performed to determine compliance of replaced or additional work with specified requirements at the Contractor's expense.

END OF SECTION 033000

SECTION 033543 - POLISHED CONCRETE FLOOR FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Polished Concrete: The multi-step operation of mechanically grinding, honing, and polishing a concrete surface using diamond abrasives in conjunction with a chemical densifier. Burnishing that depends on chemical polish for the finish is not acceptable.

1.3 REFERENCES

A. American National Standards Institute:
   1. ANSI/NFSI B101.1, Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials.

B. Concrete Polishing Association of America (CPAA)

C. American Concrete Institute (ACI)
   1. ACI 302.1R – Guide for Concrete Floor and Slab Construction

D. ASTM International
   1. ASTM C309 – Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete
   2. ASTM C171 – Standard Specification for Sheet Materials for Curing Concrete
   3. ASTM C779 – Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces
   4. ASTM C805 – Standard Test Method for Rebound Number of Hardened Concrete
   5. ASTM E 1155 – Standard Test Method for Determining Floor Flatness and Levelness Using the F number system

E. Reunion Internationale des Laboratories D'Essais et de Recherches sur les Materiaux et les Constructions (RILEM)
   1. RILEM Test Method 11.4 Standard Measurement of Reduction of Moisture Penetration Through Horizontal Concrete Surfaces

F. Definitions:
   1. Reflective Clarify:
      a. Visual Appearance: When viewed 5 feet above and perpendicular to a surface, the degree of sharpness and crispness of the reflection of overhead objects.
      b. Measurement by Device: Numbers indicate the Distinctness of Image on a scale of 1 (poor) to 100 (high) when measured according to ASTM D5767
   2. Reflective Sheen:

a. Visual Appearance: When viewed at 20 feet from and at and angle to the surface, the degree of gloss reflected from a surface

b. Measurement by Device: Numbers indicate the Gloss at 60 degress when measured according to ASTM D523-08

3. Haze:

a. Measurement by Device: Numbers indicate the variation of gloss between 20 degrees and 60 degrees, when gloss exceeds 70GU, when measured according to ASTM D4039

4. Surface Profile:

a. Measurement by Device: Numbers indicate the variation of peaks and valleys of the concrete surface by using metrology devices.

5. Abrasion Resistance:

a. Measurement by Device: Numbers indicate the minimum acceptablte revolutions of abrasion

1.4 PERFORMANCE CRITERIA

A. Static Coefficient of Friction: For polished concrete walkway surfaces, achieve following coefficient of friction by field quality control testing in accordance to ANSI/NFSI B101.1:

1. Minimum 0.6 wet SCOF, “high traction.”
2. Reflectivity: Increase of 35% as determined by gloss meter
3. Waterproof Properties: RILEM Test Method 11.4, 70% or greater reduction in absorption
4. Abrasion Resistance: ASTM C779, Method A, high resistance, no more than 0.008 inch (0.20 mm) wear in 30 minutes.
5.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data sheets and complete installation instructions.

B. Qualification Data: For qualified Installer.

C. Maintenance Data: For polished concrete flooring to include in maintenance manuals.

D. Warranty Data: Manufacturer’s standard warranty

E. Shop Drawings: : Indicate information on shop drawings as follows:

1. Typical layout including dimensions and floor grinding schedule.
2. Plan view of floor and joint pattern layout.
3. Areas to receive colored surface treatment.
4. Hardener, sealer, densifier in notes.
5. Coordinate with any phasing or sequencing of work.

F. Certifications:

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer of polished concrete floor finishing systems.

1. Supervision: Maintain competent supervisor who is at Project during times specified work is in progress, and is currently certified as Craftsman - Level I or higher by CPAA.

B. Walkway Auditor: Certified by CPAA or NFSI to test bonded abrasive polished concrete floors for dynamic and static coefficient of friction according to ANSI B101.1 and B101.3.

C.

D. Source Limitations: Obtain components including penetrating hardeners, chemical stain, sealer, joint filler, and accessory materials for polished concrete floor finish system from same manufacturer as concrete floor stain/dye or approved by concrete floor stain/dye manufacturer.

E. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for materials and execution. Match Architect's sample

1. Build mockups of full-thickness sections of concrete slab with specified stain and polish finishing system to demonstrate typical joints; surface color, pattern, and texture; curing; and standard of workmanship.
2. Concrete mix design and finishing shall be identical to that used in the Work.
3. Build mockups of polished concrete in the location and of the size indicated or, if not indicated, build mockups where directed by Architect and not less than ~~96~~ 120 inches by ~~96~~ 120 inches.
4. Notify Architect seven days in advance of dates and times when mockups will be constructed.
5. Placement and finishing work shall be performed by same personnel as will place and finish concrete for Project.
6. Perform grinding, honing, and polishing work as scheduled for Project using same personnel as will perform work for Project.
7. Protect and maintain approved field mock-ups during construction in an undisturbed condition as a standard for judging completed work.
8. Obtain Architect's approval of mockups before starting construction.
9. If Architect determines that mockups do not meet requirements, demolish and remove them from the site and cast others until mockups are approved.
10. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
11. Demolish and remove mockups when directed.

F. Preinstallation Conference: Conduct conference at Project site.

1. Consult General Contractor, Structural Engineer, Architect and Concrete Contractor prior to installation of concrete slab to ensure complete understanding of substrate preparation, reinforcement, penetrations, mix design, placing and finishing requirements, etc.
2. Verify that the concrete slab will meet the minimum compressive strength and have a minimum flatness rating required by concrete stain and finishing material manufacturer and specified in Division 3 Section "Cast-In-Place Concrete," and "Project Conditions."

3. Confirm that the General Contractor through coordination with other trades will be responsible for the protection of the slab during construction to ensure that no contaminants such as (but not limited to) oil, grease, paint, adhesives, flux, etc will be present at the time of concrete staining or polishing.
4. Review methods and procedures related to polished concrete floor finishing, including but not limited to, the following:
   a. Concrete mixture design.
   b. Quality control of concrete materials and polished floor finishing construction practices.
5. Require representatives of each entity directly concerned with polished concrete floor finishing to attend, including the following:
   a. Contractor's superintendent.
   b. Ready-mix concrete manufacturer.
   c. Polished concrete floor finishing Installer.
   d. Manufacturer's representative of polished concrete floor finishing system.
   e. Walkway auditor

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage, mixing with other components, and application.

B. Store materials in a clean, dry area to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.

C. Keep products from freezing.

D. Dispense special concrete finish materials from factory numbered and sealed containers. Maintain record of container numbers.

E. Protect materials during handling and application to prevent damage or contamination.

1.8 PROJECT CONDITIONS

A. Environmental Limitations:
   1. Comply with manufacturer’s written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation and other conditions affecting installation performance.
   2. Concrete must be cured a minimum of 28 days or as directed by the manufacturer before application of grinding and polishing process can begin.

B. Damage and Stain Prevention: Take precautions to prevent damage and staining of concrete surfaces to be polished.
   1. Prohibit use of markers, spray paint, and soapstone.
   2. Prohibit improper application of liquid membrane film forming curing compounds.

3. Prohibit vehicle parking over concrete surfaces.

4. Prohibit pipe-cutting operations over concrete surfaces.

5. Prohibit storage of any items over concrete surfaces for not less than 28 days after concrete placement.

6. Prohibit ferrous metals storage over concrete surfaces.

7. Protect from petroleum, oil, hydraulic fluid, or other liquid dripping from equipment working over concrete surfaces.

8. Protect from acids and acidic detergents contacting concrete surfaces.

9. Protect from painting activities over concrete surfaces.

C. Close areas to traffic during and after floor application for time period recommended in writing by licensed installer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering polished concrete floor finishing products that may be incorporated into the Work include, but are not limited to, the following:

1. Bomanite Corp.
2. L&M Construction Chemicals, Inc.
3. L. M. Scofield Company.
4. RetroPlate

2.2 MATERIALS

A. General: Provide materials in conformance with “Source limitations” article.

B. Penetrating Liquid Floor Treatment (Densifier and Stain Resistance): Clear, chemically reactive, waterborne solution of inorganic silicate materials and proprietary components; odorless; colorless; that penetrates and densifies concrete surfaces and provides additional stain resistance. Provide breathable treatment which permits moisture transmission through concrete.

1. Available Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Advanced Floor Products; “Retro-Plate 99
b. Bomanite Corporation; “Stabilizer Pro.”
c. L&M Construction Chemicals, Inc.; “FSG Hardener Plus.”
d. L. M. Scofield Co.; “Formula One Lithium Densifier.”

C. Repair Material: Manufacturer's standard product that is designed to repair cracks and surface imperfections. The specified material must have sufficient bonding capabilities to adhere after the polishing to the concrete surface and provide abrasion resistance equal to or greater than the surrounding concrete substrate

D. Patching Materials: Manufacturer's recommended facing mix to facilitate grinding and polishing. Trowel or spray applied mortar based on Type II Portland cement blend modified with bonding agent designed to bond to prepared concrete and cure rapidly in order to aid grinding production.

E. Joint Fillers: Multi-component Pourable Urethane Sealant for traffic exposure, designed to fill and support the sawed joints in a concrete slab while being compatible with the concrete slab grinding and polishing processes. Provide product acceptable to polished floor finishing system manufacturer.

1. Available Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Euco; "QWIKjoint."

b. Hi-Tech Structural Systems; "Polyurea Joint Filler HT-PE85"

c. L&M Construction Chemicals, Inc.; "Joint Tite 750."

F. Related Materials:

1. Neutralizing Agent: Tri-sodium Phosphate or Baking Soda.

2. Water: Potable.

G. Stain: Penetrating chemical stain compatible with liquid floor treatment.

1. Available Products: Subject to compliance, available products include, but are not limited to, the following:

a. Bomanite Corporation; "Chemical Stain."

b. L&M Construction Chemicals, Inc.; ""

c. L. M. Scofield Co.; "Lithochrome Chemstain" or "Tintura."

d. Retro Plate, "Ameripolish Dyes"

2. Shall include manufacturer available standard and custom colors.

2.3 CONCRETE MIXTURES

A. Concrete Slab-on-Grade materials and mixture properties are specified in Division 3 Section "Cast-in-Place Concrete."

1. Compressive Strength (28 Days): As specified.

2. Slump Limit: As specified.

3. Curing requirements as specified.

2.4 CONTROL JOINTS

A. Provide saw-cut weakened-plane joints in conformance with Division 3 Section "Cast-in-Place Concrete."

PART 3 - EXECUTION

3.1 COORDINATION

A. Coordinate substrate work of Division 3 Section "Cast-in-Place Concrete" for polished concrete slab finishes, including aggregates, admixtures, and requirements in order to obtain specified finish.

3.2 EXAMINATION

A. Examine substrate, with installer present, for conditions affecting performance of finish. Rectify conditions detrimental to timely and proper work. Do not proceed until unsatisfactory conditions are corrected.

1. Examine exposed subgrades and sub-base surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
2. Verify that floor surfaces are free of construction damage and contaminants.

B. Verify that base slab meets finish and surface profile requirements in Division 3 Section "Cast-In-Place Concrete," and "Project Conditions" above.

C. Confirm concrete has attained adequate strength to begin polishing without experiencing fine aggregate loss from the initial grinding process or as directed by floor finish system manufacturer before application can begin.

D. Repair of defective concrete due to improper installation is the Polishing Concrete Contractor's responsibility. Removal and replacement of concrete that cannot be repaired and patched to Architect's approval is the Concrete Contractor's responsibility. The determination of whether the concrete can be repaired or must be removed and replaced is the General Contractor's to make with the knowledge that adequate cure time of replaced sections must be allowed prior to commencing the grinding, staining and polishing process.

E. Do not use stain removing agents unless approved in writing by the manufacturer.

3.3 CONCRETE PROTECTION AND CURING

A. Specified in Division 3 Section "Cast-in-Place Concrete."

3.4 APPLICATION

A. Newly placed concrete shall be at least 30 days old before staining.

B. Protect adjacent surfaces.

C. Prepare surfaces according to manufacturer's written instructions and as follows:

1. Clean concrete thoroughly by scraping, applying solvents or stripping agents, sweeping and pressure washing, or scrubbing with a rotary floor machine and detergents recommended by stain manufacturer. Rinse until water is clear and allow surface to dry.
   a. Do not use acidic solutions to clean surfaces.
2. Fill control joints with traffic exposure joint filler and shave prior to the grinding and polishing process, or as required by floor finish system manufacturer.

D. Provide polished concrete floor slab finishing, including specialty hardening and polishing process according to manufacturer's written instructions and as follows:
1. Exposure of Aggregate: Grind concrete to the following exposure:
   a. Class B: Fine Aggregate (Salt and Pepper) Finish, exposing only the fine aggregate such as sand and small aggregate with the concrete. Approximate surface cut of 1/16 inch.
2. Polish: Polish to the following level of finish per IPCI and in compliance with manufacturer system guidelines for number of grinding and polishing steps and grits:
   a. Level 2: Satin (Honed), (matte appearance with or without slight diffused reflection) with Low to Medium Sheen, 400 grit, with a gloss reading of 10-20.
3. Clean floor thoroughly after each polishing/grinding step.
4. Stain: Apply stain solution by methods and techniques required by manufacturer to produce finish matching approved field mock-ups.
   a. Maintain wet edge, working newly applied solution into edges of adjacent wet edges of previously treated surfaces.
   b. Maintain consistent saturation throughout application.
   c. Avoid splashing, dripping, or puddling of solution on adjacent substrates.
   d. When color matches approved mock-ups, neutralize as required by manufacturer.
5. Apply penetrating concrete floor treatment (sealer/hardener) in accordance with manufacturer’s instructions.
6. Polish to pre-determined level based on test sample.
7. Polish to within 1/2-inch of vertical surfaces.

E. Properly dispose of collected dry dust from polishing.

3.5 REPAIRS AND PROTECTION

A. Remove and replace polished floor finishing that is broken or damaged or does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Protect polished floor finishing from damage. Exclude traffic from polished concrete floors for at least 14 days after placement. Cover with breathable product, such as Kraft paper or thin curing blanket. Do not cover with Masonite, plywood, or polyethylene.

C. Repair damages to adjacent surfaces caused by cleaning operations.

D. Maintain polished floor finishing free of stains, discoloration, dirt, and other foreign material.

E. Sweep polished concrete floors not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 033544

SECTION 034500 - ARCHITECTURAL PRECAST CONCRETE (APC) - PLANT CAST

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUBMITTALS

A. Product data and instructions for manufactured materials and products. Include mix designs, certifications, and laboratory test reports as required. Include water absorption test reports for units with exterior exposure.

B. Shop Drawings: Submit shop drawings prepared by or under the supervision of a qualified professional engineer detailing fabrication and installation of APC units.

1. Detail fabrication and installation of architectural precast concrete units.
2. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.
3. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish.
4. Indicate details at building corners.
5. Indicate separate face and backup mixture locations and thicknesses.
6. Indicate type, size, and length of welded connections by AWS standard symbols. Detail loose and cast-in hardware and connections.
7. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
8. Indicate locations, extent, and treatment of dry joints if two-stage casting is proposed.
9. Include plans and elevations showing unit location and sequence of erection for special conditions.
10. Indicate location of each architectural precast concrete unit by same identification mark placed on panel.
11. Indicate relationship of architectural precast concrete units to adjacent materials.
12. Indicate locations, dimensions, and details, including corner units and special shapes, and joint treatment.
13. Indicate locations, dimensions, and details of stone facings, anchors, and joint widths.
14. If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.

C. Samples: Two samples approximately 12-inches x 12-inches x 2-inches (300 by 300 by 50 mm) to illustrate quality, color, and texture of surface finish matches Architect's control sample.

1. Samples for each unit required, showing full range of color and texture expected. Include Sample showing color and texture of joint treatment.

a. Grout Samples for Initial Selection: Color charts consisting of actual sections of grout showing manufacturer's full range of colors.

b. Grout Samples for Verification: Showing color and texture of joint treatment.

D. Design mixes for each concrete mix.

E. Material test reports from a qualified independent testing agency evidencing compliance with requirements of the following based on comprehensive testing of current materials:

1. Concrete materials.
2. Reinforcing materials.
3. Admixtures.
4. Water-absorption test reports.

F. Material certificates in lieu of agency test reports, when permitted by Architect, signed by fabricator certifying that each material item complies with requirements.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and fabricator

B. Welding certificates.

C. Material Certificates: For the following items:

1. Cementitious materials.
2. Reinforcing materials and prestressing tendons.
3. Admixtures.
4. Bearing pads.
5. Structural-steel shapes and hollow structural sections.
6. Stone anchors.
7. Insulation.

D. Material Test Reports: For aggregates.

E. Preconstruction test reports.

F. Source quality-control test reports.

G. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A precast concrete erector qualified and designated by PCI's Certificate of Compliance to erect Category A (Architectural Systems) for non-load.

B. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

1. Designated as a PCI-certified plant for Group A, Category A1 - Architectural Cladding and Load Bearing Units at time of bidding.

C. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D.1.1M, "Structural Welding Code - Steel"; and AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."

E. Sample Panels: After sample approval and before fabricating architectural precast concrete units, produce a minimum of two sample panels approximately 16 sq. ft. (1.5 sq. m) in area for review by Architect. Incorporate full-scale details of architectural features, finishes, textures, and transitions in sample panels.

1. Locate panels where indicated or, if not indicated, as directed by Architect.
2. Damage part of an exposed-face surface for each finish, color, and texture, and demonstrate adequacy of repair techniques proposed for repair of surface blemishes.
3. After acceptance of repair technique, maintain one sample panel at manufacturer's plant and one at Project site in an undisturbed condition as a standard for judging the completed Work.
4. Demolish and remove sample panels when directed.

F. Range Samples: After sample panel approval and before fabricating architectural precast concrete units, produce a minimum of three sets of samples, approximately 16 sq. ft. (1.5 sq. m) in area, representing anticipated range of each color and texture on Project's units. Maintain one set of range samples at Project site and remaining range sample sets at manufacturer's plant as color and texture approval reference.

G. Integrated Exterior Mockups: Attend preinstallation conference and provide architectural precast concrete work for integrated exterior mockup as specified in Division 1 section "Quality Requirements."

1.5 PRECONSTRUCTION TESTING

A. Preconstruction Stone Anchor Testing: Engage a qualified testing agency to perform preconstruction testing according to ASTM C 1354/C 1354M or ASTM E 488, modified as follows:

1. Furnish test specimens, including stone anchors, that are representative of materials proposed for incorporation into the Work.
2. Anchorage Tests: Test 12 inches (300 mm) square samples for each combination of stone variety, orientation of cut, finish, and anchor type proposed for use on Project. Test for shear and tensile strength of anchorage system.

1.6 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground or other rehandling.

B. Support units during shipment on nonstaining shock-absorbing material.

C. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.

D. Place stored units so identification marks are clearly visible, and units can be inspected.

E. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.

F. Lift and support units only at designated points indicated on Shop Drawings.

PART 2 - PRODUCTS

2.1 FABRICATORS

A. Available Fabricators: Subject to compliance with requirements, fabricators offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Seaboard Concrete Products Company - Richmond, Virginia (Phone: 804-275-0802)
2. American Stone, Inc. – Newington, Virginia (Phone 703-550-9460)
3. Arban & Carosi, Inc. – Woodbridge, Virginia (Phone 703-491-5121)

2.2 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.

1. Accurately construct molds, mortar-tight, of sufficient strength to withstand pressures due to concrete-placing operations, temperature changes.
2. Maintain molds to provide completed architectural precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.
3. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

B. Form Liners: Units of face design, texture, arrangement, and configuration to match those used for precast concrete design reference sample. Use with manufacturer's recommended form-release agent that does not bond with, stain, or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

C. Surface Retarder: Chemical set retarder, capable of temporarily delaying final hardening of newly placed concrete mixture to depth of reveal specified.

2.3 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 117.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type III. Use “white” Portland cement.

B. Normal-Weight Aggregates: ASTM C 33, with coarse aggregates meeting Class 5S and MNL-117 requirements.

1. Use aggregate from same source as those used in Architect's control sample.
2. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project
3. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.
   a. Gradation: To match design reference sample.
4. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate; to match approved finish sample.

C. Coloring Agent: ASTM C 979, synthetic mineral oxide pigments or colored water-reducing admixtures, color stable, nonfading, resistant to lime and other alkalis.

D. Water: Potable; free from deleterious material that may affect concrete color stability, setting, or strength and complying with chemical limits of PCI MNL 117.

E. Air-Entraining Admixture: ASTM C 260, certified by manufacturer as compatible with other required admixtures.

F. Water-Reducing, Retarding, or Accelerating Admixtures: ASTM C 494, type as selected by Fabricator and containing not more than 0.1 percent chloride ions.

2.5 CONCRETE MIXES

A. Prepare design mixes for each type of concrete required.

B. Design mixes may be prepared by a qualified independent testing agency or by qualified architectural precast manufacturing plant personnel at architectural precast fabricator's option.

C. Limit water-soluble chloride ions to the maximum percentage by weight of cement permitted by ACI 318.

D. Normal-Weight Concrete Face and Back-Up Mixes: Proportion mixes by either laboratory trial batch or field test data methods according to ACI 211.1, using materials to be used on the Project, to provide normal-weight concrete with the following properties:

1. Compressive Strength (28-Day): 5000 psi.
2. Maximum Water-Cement Ratio at Point of Placement: 0.40.

E. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content complying with MNL-117 requirements.

F. Water Absorption: Maximum 6 percent by weight, tested according to PCI MNL 117.

G. When included in design mixes, add other admixtures to concrete mixes according to manufacturer's directions.

2.6 FABRICATION

A. Mix concrete according to MNL-117 and requirements of this Section. Following concrete batching, no additional water may be added.

B. Place concrete in a continuous operation to prevent seams or planes of weakness from developing in precast units. Comply with requirements of MNL-117 for measuring, mixing, transporting, and placing concrete. Fabricate units by the “Wet Pour” process; the “Dry Tamp” fabrication method will not be accepted.

C. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items. Use equipment and procedures complying with MNL-117.

1. Comply with ACI 306R procedures for cold-weather concrete placement.
2. Comply with ACI 305R procedures for hot-weather concrete placement.

D. Cure concrete according to the requirements of MNL-117 by moisture retention without heat or by accelerated heat curing, using low-pressure live steam or radiant heat and moisture.

E. Fabricate architectural precast concrete units straight and true to size and shape with exposed edges and corners precise and true. Provide uniformly chamfered edge and corner treatment.

F. Discard architectural precast concrete units that are warped, cracked, broken, spalled, stained, or otherwise defective unless repairs are permitted by Architect and meet requirements.

2.7 FABRICATION TOLERANCES

A. Generally, comply with MNL-117 recommendations.

2.8 FINISHES

A. Panel faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units to match approved mockups and as follows:

1. Design Reference Sample: Existing cast-in-place buttresses, but not wood form texture.
2. Float Finish: Match existing as-cast or rubbed finish.

2.9 STEEL CONNECTION MATERIALS

A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.

B. Carbon-Steel-Headed Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished, AWS D1.1/D1.1M, Type A or Type B, with arc shields and with minimum mechanical properties of PCI MNL 117, Table 3.2.3.

C. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A or ASTM F 1554, Grade 36 (ASTM F 568M, Property Class 4.6); carbon-steel, hex-head bolts and studs; carbon-steel nuts, ASTM A 563 (ASTM A 563M); and flat, unhardened steel washers, ASTM F 844.

D. Shop-Primed Finish: Prepare surfaces of nongalvanized steel items, except those surfaces to be embedded in concrete, according to requirements in SSPC-SP 3 and shop-apply [lead- and chromate-free, rust-inhibitive primer, complying with performance requirements in MPI 79] according to SSPC-PA 1.

E. Welding Electrodes: Comply with AWS standards.

2.10 BEARING PADS

A. Provide bearing pads for architectural precast concrete units as recommended by precast fabricator for application:

2.11 ACCESSORIES

A. Precast Accessories: Provide clips, hangers, high-density plastic or steel shims, and other accessories required to install architectural precast concrete units.

2.12 GROUT MATERIALS

A. Sand-Cement Grout: Portland cement, ASTM C 150/C 150M, Type I, and clean, natural sand, ASTM C 144 or ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 to 3 parts sand, by volume, with minimum water required for placement and hydration. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C 1218/C 1218M.

B. Nonmetallic, Nonshrink Grout: Packaged, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C 1218/C 1218M.

C. Epoxy-Resin Grout: Two-component, mineral-filled epoxy resin; ASTM C 881/C 881M, of type, grade, and class to suit requirements.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install architectural precast concrete units level, plumb, square, and true, without exceeding the recommended erection and location tolerances of MNL-117. Provide temporary supports and bracing as required to maintain position, stability, and alignment as units are being permanently connected.

1. Maintain horizontal and vertical joint alignment and uniform joint width.
2. Remove projecting hoisting devices and cement-grout fill recessed hoisting devices.

3.2 SETTING APC WITH MORTAR

A. Set all pieces in full bed of mortar with vertical joints slushed full, unless otherwise indicated. Rake head joints in coping and similar pieces open for sealant.

1. Place setting buttons of adequate size, in sufficient quantity, and of same thickness as indicated joint width, to prevent mortar from squeezing out and to maintain uniform joint widths. Hold buttons at least one joint width back from face of pieces.
2. Do not set heavy pieces or projecting courses until mortar in courses below has hardened sufficiently to resist being squeezed out of joint.
3. Fill all dowel holes and anchor slots completely with mortar or non-shrink grout.

3.3 REPAIRS

A. Repair exposed exterior surfaces of architectural precast concrete units to match color, texture, and uniformity of surrounding concrete when permitted by Architect. Warranty repairs for a period of three years after Architect's acceptance of repaired surfaces.

B. Remove and replace damaged architectural precast concrete units when repairs do not meet requirements.

3.4 CLEANING

A. Clean exposed surfaces of APC units after erection to remove weld marks, other markings, dirt, and stains.

1. Wash and rinse according to architectural precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
2. Do not use cleaning materials or processes that could change the appearance of exposed APC finishes.

END OF SECTION 034500

SECTION 050519 – POST-INSTALLED CONCRETE ANCHORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes post-installed cartridge injection adhesive anchors for concrete.

B. Related Sections:

1. Division 01 Section "Special Inspection Services" for administrative and procedural requirements for special inspection services.
2. Division 03 Section "Building Cast-In-Place Concrete" for concrete supports.
3. Division 05 Section "Structural Steel Framing" for anchoring structural steel to concrete supports.

1.3 SUBMITTALS

A. Product Specifications: Include recommended design values and physical characteristics for adhesive anchors.

B. Product Certificates: For each anchor type, provide ICC ES Evaluation Services Reports signed by manufacturers.

C. Material Test Reports: From a qualified testing agency, certified test reports showing compliance with specified performance characteristics and physical properties.

D. Manufacturer's installation instructions.

E. Installer Qualifications and Procedures: Submit installer qualifications and a letter of procedure stating the following:

1. Method of drilling.
2. Product proposed for use.
3. Complete installation procedure.
4. Manufacturer training date.
5. List of personnel to be trained on anchor installation.

F. Coordination Drawings: Prior to drilling any holes in existing structure, locate existing reinforcing steel by appropriate non-destructive methods including X-ray, Ground Penetrating Radar, or other approved method.

1. Submit coordination drawings of each anchor indicating proposed anchor location and position of existing steel reinforcing
2. Identify any potential conflicts between existing reinforcing steel and proposed anchor locations.
3. Direction for corrective action will be provided within 7 days.

1.4 QUALITY ASSURANCE

A. Installer Training: Conduct a thorough training session with the manufacturer or manufacturer's representative for Contractor on the project. Training shall consist of a review of the complete installation process for drilled-in anchors, to include but no limited to:

1. Hole drilling procedure.
2. Hole preparation and cleaning technique.
3. Adhesive injection technique and dispenser training and maintenance.
4. Reinforcing steel dowel or anchor preparation and installation.
5. Proof loading procedures.

B. Anchor Certification: Anchors shall conform with current ICC ES Acceptance Criteria as indicated in an ICC ES Evaluation Services Report for each anchor.

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

D. Preinstallation Conference: Conduct conference at Project site.

1. Review post-installed concrete anchor installation procedures.
2. Require representatives of each entity directly concerned with post-installed concrete anchor to attend, including, but not limited to, the following:

   a. Contractor's superintendent.
   b. Post-installed concrete anchor installer.
   c. Special Inspector
   d. Architect
   e. Structural Engineer

3. Review special inspection and testing agency procedures.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store anchors and materials in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 FASTENER AND ANCHOR MATERIALS

A. Un-headed Anchor Rods: ASTM F1554 Grade 36.

B. Reinforcing Dowels: ASTM A615

2.2 DRILLED-IN ANCHORS

A. Cartridge Injection Adhesive Anchors: Threaded steel rod, inserts or reinforcing dowels, complete with nuts, washers, polymer or hybrid mortar adhesive injection system, and manufacturer's installation instructions. Type and size as indicated on the Drawings.

1. Unless otherwise indicated on the Drawings, provide carbon steel threaded rods conforming to ASTM F1554 Grade 36.
2. Reinforcing dowels shall be A615 Grade 60.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Drilled-in Anchors:

1. Drill holes with rotary impact hammer drills using carbide-tipped bits, hollow drill bit system, or core drills using diamond core bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.

   a. Cored Holes: Where anchors are permitted to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer. Properly clean cored hole per manufacturer's instructions.
   b. Embedded Items: Identify position f reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling.

2. Perform anchor installation in accordance with manufacturer instructions.
3. Cartridge Injection Adhesive Anchors:

   a. Clean all holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive.

b. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
c. Follow manufacturer recommendations to ensure proper mixing of adhesive components.
d. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface.
e. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole.
f. Do not disturb or load anchors before manufacturer specified cure time has elapsed.

4. Observe manufacturer recommendations with respect to installation temperatures for cartridge injection adhesive anchors.

3.2 REPAIR OF DEFECTIVE WORK

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 SPECIAL INSPECTIONS

A. Special Inspections and tests shall be performed by the Special Inspector or Special Inspection Agency.

B. Verification and inspection of concrete construction shall be in accordance with Section 1705.3 of VCC 2012 and as follows:

1. Initial Inspection: Perform initial inspection of the Work to verify compliance with the requirements of the contract documents, including the following:

a. Anchor type
b. Anchor dimensions.
c. Concrete type.
d. Concrete compressive strength.
e. Adhesive identification and expiration date.
f. Hole dimensions.
g. Hole cleaning procedures.
h. Anchor spacing and edge distances.
i. Concrete thickness.
j. Anchor embedment
k. Tightening torque

l. Adherence to manufacturer's printed installation instructions.
m. Confirm Contractor's installer is certified for anchor installation.

2. Periodic Inspection: Subsequent installations of the same anchor type and size by the same construction personnel are permitted to be performed in the absence of the Special Inspector. Any change in the anchor product being installed or the personnel performing the installation requires an initial inspection.

   a. For ongoing installations over an extended period, the special inspector must make regular inspections to confirm correct handling and installation of the product.

3. Continuous Inspection: Horizontal, upwardly inclined or overhead anchors subjected to sustained tension loads shall be continuously inspected.

4. Anchor Testing: Drilled-in anchors shall be proof loaded by the Special Inspector. Adhesive anchors shall not be torque tested unless otherwise directed by the Engineer. If more than 10 percent of the tested anchors fail to achieve the specified torque or proof load within the limits as defined on the Drawings, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Engineer.

   a. Testing Frequency is at the discretion of the Special Inspector, unless otherwise noted.
   b. Minimum of 10 percent of post-installed concrete anchors in the overhead orientation subjected to sustained tension loads shall be proof load tested.
   c. Tension testing should be performed in accordance with ASTM E488
   d. Proof loads shall be applied with calibrated hydraulic ram. Displacement of adhesive anchors at proof load shall not exceed one tenth of the nominal anchor diameter.

C. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Additional testing and inspecting will be performed to determine compliance of replaced or additional work with specified requirements at the Contractor's expense.

END OF SECTION 050519

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural steel.
2. Grout.

B. Related Sections:

1. Division 01 Section “Special Inspection Services” for administrative and procedural requirements for special inspection services.
2. Division 05 Section “Post-Installed Concrete Anchors” for anchoring structural steel to concrete supports.
3. Division 05 Section "Architecturally Exposed Structural Steel Framing" for additional requirements for architecturally exposed structural steel.
4. Division 09 painting Sections for surface-preparation and priming requirements.

1.3 DEFINITIONS

A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC 360.
2. Use ASD; data are given at service-load level.

B. Moment Connections: Type FR, fully restrained.

C. Heavy Equipment: Existing drawings indicate the existing plaza structure has been designed to support a live load of 100 PSF. Submit calculations, sealed by a Virginia licensed professional engineer, for any heavy equipment proposed to be placed on or operated on the existing plaza structure indicating the existing structure is not overstressed by the equipment.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other sections
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint qualified by testing, including the following:

1. Power source (constant current or constant voltage).

D. Welding certificates. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the “Quality Assurance” Article.

E. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

F. Mill test reports for structural steel, including chemical and physical properties.

G. Structural Calculations for Heavy equipment: Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Include the equipment weight and limits of operation in the submittal.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program.

1. Fabricator shall be registered with and approved by authorities having jurisdiction.
2. Exception: At the Contractor’s expense, an Independent Testing Agency acceptable to Architects shall verify that the fabricator maintains detailed fabrication and quality

control procedures which provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved drawings, project specifications and referenced standards. The Independent Testing Agency shall review the procedures to the completeness and adequacy relative to the Code requirements for the fabricators scope of work.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 360.
3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.8 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1. Coordinate the location of post-installed concrete anchors with the existing steel reinforcement prior to fabrication of all base and anchor plates

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992 or ASTM A 572, Grade 50.

B. Channels and Angles: ASTM A 36

C. Plate and Bar: ASTM A 36.

D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.

E. Raised Pattern Floor Plate: ASTM A786

F. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

B. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.

1. Nuts: ASTM A 563 heavy-hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436, Type 1, hardened carbon steel.
4. Finish: Plain.

2.3 PRIMER

A. Primer: Comply with Division 09 painting Sections.

2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.

1. Fabricate beams with rolling camber up.
2. Mark and match-mark materials for field assembly.
3. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces to be field welded.
2. Galvanized surfaces.
3. Surfaces indicated not to be primed in Division 09 painting Sections.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel Erector present, elevations of concrete-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Base Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 SPECIAL INSPECTIONS

A. Special Inspections and tests shall be performed by the Special Inspector or Special Inspection Agency.

B. Where fabrication of structural load-bearing members and assemblies is being performed on the premises of the fabricators shop, special inspection of the fabricated item shall be performed.

1. Verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and that those procedures are being implemented. This inspection will provide a basis for determination of the fabricator's ability to conform to approved drawings, project specifications, and referenced standards.
2. Exception: Special inspections are not required where the work is done on the premises of a fabricator registered and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents.

C. Verification and inspection of steel construction shall be in accordance with Section 1705.2.1 of VCC 2012, and as follows:

1. Welding: Welding inspection shall be in compliance with AWSD1.1. In addition to visual inspection, welds may be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at Special Inspector's option:

   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
   c. Ultrasonic Inspection: ASTM E 164.
   d. Radiographic Inspection: ASTM E 94.

2. Details: Perform an inspection of the steel frame to verify compliance with the details shown on the approved construction documents such as bracing, stiffening, member locations and proper application of joint details at each connection.

3. High Strength Bolts: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

   a. General: While Work is in progress, determine that the requirements for bolts, nuts, washers, paint, bolted parts and installation and tightening in such standards are met. For bolts requiring pretensioning, observe the preinstallation testing and calibration procedures when such procedures are required by the installation method or by project plans or specifications; determine that all plies of connected materials have been drawn together and properly snugged and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to snug-tight condition, verify that the connected materials have been drawn together and properly snugged.
   b. Periodic monitoring: Monitoring of bolt installation for pretensioning is permitted to be performed on a periodic basis when using the turn-of-nut method with matchmarking techniques, the direct tension indicator method or the alternate design fastener (twist-off bolt) method. Joints designated as sung tight need be inspected only on a periodic basis.
   c. Continuous monitoring: Monitoring of bolt installation for pretensioning using the calibrated wrench method or the turn-of-nut method without matchmarking shall be performed on a continuous basis.

D. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

E. Additional testing performed to determine compliance of corrected Work with specified requirements shall be at Contractor’s expense.

3.6 REPAIRS AND PROTECTION

A. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

   1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

B. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

END OF SECTION 05120

SECTION 051213 - ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes architecturally exposed structural-steel framing.

B. Related Sections:

1. Division 01 Section “Special Inspection Services” for administrative and procedural requirements for special inspection services.
2. Division 05 Section "Structural Steel Framing" for additional requirements applicable to AESS.
3. Division 05 Section "Metal Fabrications" for miscellaneous steel fabrications and other metal items not defined as structural steel.
4. Division 09 painting Sections for surface-preparation and priming requirements.

1.3 DEFINITIONS

A. Architecturally Exposed Structural Steel: Structural steel designated as "architecturally exposed structural steel" or "AESS" in the Contract Documents.

B. Category 1 AESS: AESS that is within 96 inches vertically and 36 inches horizontally of a walking surface and is visible to a person standing on that walking surface or is designated as "Category 1 architecturally exposed structural steel" or "AESS-1" in the Contract Documents.

C. Category 2 AESS: AESS that is within 20 feet vertically and horizontally of a walking surface and is visible to a person standing on that walking surface or is designated as "Category 2 architecturally exposed structural steel" or "AESS-2" in the Contract Documents.

D. Category 3 AESS: AESS that is not defined as Category 1 or Category 2 or that is designated as "Category 3 architecturally exposed structural steel" or "AESS-3" in the Contract Documents.

1.4 SUBMITTALS

A. Shop Drawings: Show fabrication of AESS components. Shop Drawings for structural steel may be used for AESS provided items of AESS are specifically identified and requirements below are met for AESS.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain. Indicate grinding, finish, and profile of welds.
3. Indicate exposed surfaces and edges and surface preparation being used.
4. Indicate special tolerances and erection requirements.

B. Samples: Submit samples of AESS to set quality standards for exposed welds for Category 1 AESS.

1. Two steel plates, 3/8 by 8 by 4 inches, with long edges joined by a groove weld and with weld ground smooth.
2. Steel plate, 3/8 by 8 by 8 inches, with one end of a short length of rectangular steel tube, 4 by 6 by 3/8 inches, welded to plate with a continuous fillet weld and with weld ground smooth and blended.
3. Rectangular steel tube, minimum 8 inches by 8 inches, with end of another rectangular steel tube, approximately 4 inches by 4 inches, welded to its side at a 75-degree angle with a continuous fillet weld along three sides and a flare-bevel partial penetration weld along the other side, and with all welds ground smooth and blended.

1.5 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Use special care in handling to prevent twisting, warping, nicking, and other damage. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.7 PROJECT CONDITIONS

A. Field Measurements: Where AESS is indicated to fit against other construction, verify actual dimensions by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

PART 2 - PRODUCTS

2.1 PRIMER

A. Primer: Comply with Division 09 painting Sections.

2.2 FABRICATION

A. Shop fabricate and assemble AESS to the maximum extent possible. Locate field joints at concealed locations if possible. Detail assemblies to minimize handling and to expedite erection.

B. In addition to special care used to handle and fabricate AESS, comply with the following:

1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, and roughness.
2. Grind sheared, punched, and flame-cut edges of Category 1 AESS to remove burrs and provide smooth surfaces and edges.
3. Fabricate Category 1 AESS with exposed surfaces free of mill marks, including rolled trade names and stamped or raised identification.
4. Fabricate Category 1 and Category 2 AESS with exposed surfaces free of seams to maximum extent possible.
5. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.
6. Fabricate with piece marks fully hidden in the completed structure or made with media that permits full removal after erection.
7. Fabricate Category 1 AESS to the tolerances specified in AISC 303 for steel that is designated AESS.
8. Fabricate Category 2 and Category 3 AESS to the tolerances specified in AISC 303 for steel that is not designated AESS.
9. Seal-weld open ends of hollow structural sections with 3/8-inch closure plates for Category 1 AESS.

C. Coping, Blocking, and Joint Gaps: Maintain uniform gaps of 1/8 inch with a tolerance of 1/32 inch for Category 1 AESS.

D. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.

1. Cut, drill, mechanically thermal cut , or punch holes perpendicular to steel surfaces.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.3 SHOP CONNECTIONS

A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work, and comply with the following:

1. Use weld sizes, fabrication sequence, and equipment for AESS that limit distortions to allowable tolerances.
2. Provide continuous welds of uniform size and profile where Category 1 AESS is welded.
3. Grind butt and groove welds flush to adjacent surfaces within tolerance of plus 1/16 inch, minus 0 inch for Category 1 and Category 2 AESS.
4. Make butt and groove welds flush to adjacent surfaces within tolerance of plus 1/16 inch, minus 0 inch for Category 1 and Category 2 AESS. Do not grind unless required for clearances or for fitting other components, or unless directed to correct unacceptable work.
5. Remove backing bars or runoff tabs; back-gouge and grind steel smooth for Category 1 and Category 2 AESS.
6. At locations where welding on the far side of an exposed connection of Category 1 and Category 2 AESS occurs, grind distortions and marking of the steel to a smooth profile aligned with adjacent material.
7. Make fillet welds for Category 1 and Category2 AESS oversize and grind to uniform profile with smooth face and transition.
8. Make fillet welds for Category 1 and Category 2 AESS of uniform size and profile with exposed face smooth and slightly concave. Do not grind unless directed to correct unacceptable work.

2.4 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces to be field welded.
2. Surfaces indicated not to be primed in Division 09 painting Sections.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel erector present, elevations of concrete-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Examine AESS for twists, kinks, warping, gouges, and other imperfections before erecting.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep AESS secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. If possible, locate welded tabs for attaching temporary bracing and safety cabling where they will be concealed from view in the completed Work.

3.3 ERECTION

A. Set AESS accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

1. Erect Category 1 AESS to the tolerances specified in AISC 303 for steel that is designated AESS.
2. Erect Category 2 and Category 3 AESS to the tolerances specified in AISC 303 for steel that is not designated AESS.

B. Do not use thermal cutting during erection.

3.4 FIELD CONNECTIONS

A. Weld Connections: Comply with requirements in "Weld Connections" Paragraph in "Shop Connections" Article.

1. Remove backing bars or runoff tabs; back-gouge and grind steel smooth for Category 1 and Category 2 AESS.
2. Remove erection bolts in Category 1 and Category 2 AESS, fill holes, and grind smooth.
3. Fill weld access holes in Category 1 and Category 2 AESS and grind smooth.

3.5 SPECIAL INSPECTIONS AND FIELD QUALITY CONTROL

A. Special Inspections and tests shall be performed by the Special Inspector or Special Inspection Agency for AESS as specified in Division 05 Section "Structural Steel Framing." The Special Inspector will not be responsible for enforcing requirements relating to aesthetic effect.

B. Architect will observe AESS in place to determine acceptability relating to aesthetic effect.

3.6 REPAIRS AND PROTECTION

A. Remove welded tabs that were used for attaching temporary bracing and safety cabling and that are exposed to view in the completed Work. Grind steel smooth.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION 051213

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Exterior and interior framing indicated as CFSF-S on Architectural Drawings.
2. Ceiling joist framing.

B. Related Sections include the following:

1. Division 01 Section “Special Inspection Services” for administrative and procedural requirements for special inspection services.
2. Division 09 Section "Non-Structural Metal Framing" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies indicated as CFSF-NS on Architectural Drawings.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide cold-formed metal framing, not otherwise detailed on the structural drawings, capable of withstanding design loads within limits and under conditions indicated.

1. Design Loads: As indicated and as follows:

a. Dead Loads: Weights of materials and construction.
b. Wind Loads: Per VCC 2012 and as indicated.
c. Seismic Loads: Per VCC 2012 and as indicated
d. Minimum Lateral Load on Interior Walls: 5 psf

2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:

a. Exterior and Interior Non-Load-Bearing Framing: Horizontal deflection of 1/360 of the wall height.
b. Ceiling Joist Framing: Vertical deflection of 1/360 of the span.

3. .
4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:

   a. Upward and downward movement of 3/4 inch.

B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."

1.4 SUBMITTALS

A. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

   1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

A. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

   1. Grade: ST50H.
   2. Coating: G60.

B. Steel Sheet for Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:

1. Grade: 50.
2. Coating: G90.

2.2 EXTERIOR AND INTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges.

C. Vertical Deflection Clips: Manufacturer's standard **bypass or head** clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:

E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.

2.3 CEILING JOIST FRAMING

A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, punched with standard web holes, with stiffened flanges.

2.4 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Hole reinforcing plates.

2.5 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

C. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

B. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed metal framing members by screw fastening.

C. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

D. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

E. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

F. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.3 EXTERIOR AND INTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to **top and** bottom track, unless otherwise indicated. Space studs as indicated in the Shop Drawings.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings. Fasten at each stud intersection.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

3.4 JOIST INSTALLATION

A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings.

B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.

1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.
2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated.

C. Space joists as indicated.

D. Install bridging at intervals indicated. Fasten bridging at each joist intersection as follows:

1. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.

E. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, and fasteners, to provide a complete and stable joist-framing assembly.

3.5 SPECIAL INSPECTIONS

A. Special Inspections and tests shall be performed by the Special Inspector or Special Inspection Agency.

B. Verification and inspection of steel construction shall be in accordance with VCC 2012, and as follows:

1. Welding: Welding inspection shall be in compliance with AWSD1.3.
2. Details: Perform an inspection of the steel framing to verify compliance with the details shown on the approved construction documents such as bracing, stiffening, member locations and proper application of joint details at each connection.

C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

D. Additional testing performed to determine compliance of corrected work with specified requirements shall be at Contractor’s expense.

3.6 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Paint products.
2. Grout.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. Steel framing and supports for mechanical and electrical equipment.
2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
3. Bar gratings and supports.

C. Delegated-Design Submittal: For installed products indicated to comply with design loads, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Welding certificates.

C. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Qualification Data: For professional engineer.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

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

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.

D. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

E. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

F. Rolled-Stainless-Steel Floor Plate: ASTM A 793.

G. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

H. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless another weight is indicated or required by structural loads.

I. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

1. Size of Channels: 1-5/8 by 1-5/8 inches (41 by 41 mm), unless noted otherwise.
2. Material: Galvanized steel complying with ASTM A 653/A 653M, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; 0.079-inch (2-mm) nominal thickness.

3. Material: Steel complying with ASTM A 1008/A 1008M, structural steel, Grade 33 (Grade 230); 0.0677-inch (1.7-mm) minimum thickness; coated with rust-inhibitive, baked-on, acrylic enamel.

J. Cast Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.

K. Aluminum Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.

L. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.

M. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.

N. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless-steel fasteners for fastening aluminum.
2. Provide stainless-steel fasteners for fastening stainless steel.
3. Provide stainless-steel fasteners for fastening nickel silver.
4. Provide bronze fasteners for fastening bronze.

B. Wet Areas: For wet or damp areas, including locker rooms, rooms with showers, kitchens with washes or hoods, mechanical rooms with steam piping, and similar spaces, provide Type 304 stainless-steel fasteners or zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

D. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3 (ASTM A 325M, Type 3); with hex nuts, ASTM A 563, Grade C3 (ASTM A 563M, Class 8S3); and, where indicated, flat washers.

E. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 1 (A1).

F. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

G. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

H. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

I. Post-Installed Anchors: Torque-controlled expansion anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.

2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

J. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

C. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.

D. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

1. Available Products:

a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.

b. Carboline Company; Carbozinc 621.

c. ICI Devoe Coatings; Catha-Coat 313.

d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.

e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.

f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.

g. Tnemec Company, Inc.; Tneme-Zinc 90-97.

E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

F. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

H. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing[and contour of welded surface matches that of adjacent surface].

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide supplemental steel framing and supports that are not a part of structural-steel framework and are not specified in other Sections, but are necessary to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts for units installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

2.7 METAL BAR GRATINGS, GRATING FRAMES AND SUPPORTS

A. Grating: Produce metal bar gratings of description indicated per NAAMM marking system that comply with "Standard Specifications for Metal Bar Grating and Metal Bar Grating Treads" published in ANSI/NAAMM MBG 531 "Metal Bar Grating Manual."

1. Pedestrian Walkway Grating: ADA-compliant welded or pressure-locked steel grating W-10-4 or P-10-4 (1 1/4 x 3/16 inch) plain surface bearing bar; galvanized. Provide removable units with clamps and fasteners.

2. Areaway Grating: Welded or pressure-locked steel grating W-19-4 or P-19-4 (1 1/4 x 3/16 inch) plain surface bearing bar; galvanized. Provide removable units with clamps and fasteners.

B. Frames: Provide steel frames and supports for gratings. Fabricate units to sizes, shapes, and profiles indicated and required to receive gratings. Fabricate from structural steel shapes, plates, and steel bars of welded construction. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware, and similar items.

1. Unless otherwise indicated, space anchors 24 inches o.c.

C. Accessories:

1. Fasteners:

a. Tamper-resistant stainless steel screws.

b. Removable

2.8 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize exterior miscellaneous steel trim.

D. Leaf Guard.

1. Flattened expanded galvanized aluminum. Match exiting to remain leaf guard and reproduce for remaining infill openings.

2.9 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.10 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.11 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

1. For items indicated to receive paint, do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete or masonry, or unless otherwise indicated.

1. Shop prime with universal shop primer unless zinc-rich primer is indicated.

D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:

1. Exterior Items: SSPC-SP 6/NACE No. 3, “Commercial Blast Cleaning.”
2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, “Commercial Blast Cleaning.”
3. Other Items: SSPC-SP 3, “Power Tool Cleaning.”

E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, “Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel,” for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.12 ALUMINUM FINISHES

A. As-Fabricated Finish: AA-M12.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fill all holes, including vent and drain holes that will be exposed in finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

E. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

F. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

G. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports securely to, and rigidly brace from, building structure.

3.3 INSTALLING GRATINGS

A. General: Install gratings with tops flush with adjacent walking surfaces, with secure and continuous bearing on supports.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099100 “Painting.”

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 PERFORMANCE REQUIREMENTS

A. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
   1. Steel: 72 percent of minimum yield strength.

B. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails:
      a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
      b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Top Rails of Guards:
      a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
      b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   3. Infill of Guards:
      a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
      b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Provide exterior railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 SUBMITTALS

A. Product Data: For the following:
   1. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Qualification Data: For professional engineer.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing through one source from a single manufacturer.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of construction contiguous with railings by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress so as not to delay the Work.

1.6 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.2 STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513, Type 5 (mandrel drawn).

B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

C. Plates, Shapes, and Bars: ASTM A 36/A 36M.

D. Castings: Either gray or malleable iron, unless otherwise indicated.

1. Gray Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.

2. Malleable Iron: ASTM A 47/A 47M.

2.3 FASTENERS

A. General: Provide the following:

1. Steel Railings: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.

2. Provide tamper-resistant flat-head machine screws for exposed fasteners, unless otherwise indicated.

D. Anchors: Provide chemical or torque-controlled expansion anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

C. Shop Primer for Galvanized Steel: Zinc-dust, zinc-oxide primer formulated for priming zinc-coated steel and for compatibility with finish paint systems indicated, and complying with SSPC-Paint 5.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, non-corrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: Formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.5 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly

mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections, unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Non-welded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
2. Cut, reinforce, drill, and tap components to receive finish hardware, screws, and similar items. Self-tapping fasteners are not acceptable where exposed in finished work.

J. Form changes in direction as follows:

1. By radius bends of radius indicated.
   a. Provide 5-inch (center) radius bends unless indicated otherwise. For handrails, total horizontal dimension of bent pipe shall not exceed 3 inches at top centerline unless indicated otherwise.

K. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

1. Provide 12-inch radius curves unless noted otherwise.

L. Brackets, Flanges, Fittings, and Anchors: Provide brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

M. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.7 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize exterior steel and iron railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.

B. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

C. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

D. Preparation for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic-phosphate process.

E. Apply shop primer to prepared surfaces of railings, unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 “Fabrication” Article whether welding is performed in the shop or in the field.

B. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components at field splices. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

3.4 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches (125 mm) deep, unless indicated otherwise, and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Leave anchorage joint exposed; wipe off surplus anchoring material; and leave 1/8-inch (3-mm) buildup, sloped away from post.

C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

3.5 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 painting Sections.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.6 PROTECTION

A. Protect finishes of railings from damage during construction period. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055213

SECTION 057300 - DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas, pedestrian guidance and support, visual separation, or wall protection.

1.3 PERFORMANCE REQUIREMENTS

A. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
   1. Steel: 72 percent of minimum yield strength.

B. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails:
      a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
      b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Top Rails of Guards:
      a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
      b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   3. Infill of Guards:
      a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

D. Accessibility Requirements: Comply with applicable provisions in the Department of Justice 2010 ADA Standards for Accessible Design and ICC/ANSI A117.1, 2009.

1.4 SUBMITTALS

A. Product Data: For the following:
   1. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Verification: For each type of exposed finish required.
1. Fittings and brackets.
2. Welded connections.
3. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Samples need not be full height.

D. Welding certificates.

E. Qualification Data: For professional engineer.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing through one source from a single manufacturer.

B. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including structural analysis, preconstruction testing, field testing, and in-service performance.

C. Welding: Qualify procedures and personnel according to the following:
1. AWS D1.1, “Structural Welding Code--Steel.”

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating railings without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.

1.7 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails, unless otherwise indicated.

2.2 STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513, Type 5 (mandrel drawn).

B. Bars: Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.

C. Plates, Shapes, and Bars: ASTM A 36/A 36M.

D. Castings: Either gray or malleable iron, unless otherwise indicated.

1. Gray Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.
2. Malleable Iron: ASTM A 47/A 47M.

2.3 FASTENERS

A. General: Provide the following:

1. Uncoated Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed; Type 304 stainless-steel fasteners where exposed.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work, where fasteners are indicated.

1. Provide tamper-resistant flat-head machine screws for exposed fasteners, unless otherwise indicated.

D. Anchors: Provide countersunk torque-controlled expansion anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 09 Section “Painting.”

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

D. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

2.5 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

H. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

I. Form changes in direction as follows:

1. By radius bends of radius indicated or by inserting prefabricated elbow fittings of radius indicated.

J. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of hollow railing members with prefabricated end fittings.

L. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

M. Brackets, Flanges, Fittings, and Anchors: Provide brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

N. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.7 STEEL AND IRON FINISHES

A. For nongalvanized steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed railings:

1. Interior Railings (SSPC Zone 1A): SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."

C. Apply shop primer to prepared surfaces of railings, unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

D. Painted Finish: Comply with Division 09 painting Sections.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).

3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 "Fabrication" Article whether welding is performed in the shop or in the field.

B. Non-welded Connections: Use mechanical joints for permanently connecting railing components at field splices where field welding is not proposed. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

3.3 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

C. Anchor posts to supporting surfaces with flanges as indicated, connected to posts and to metal supporting members as follows:

1. For steel railings, weld flanges to posts and bolt to supporting surfaces.

3.4 ANCHORING RAILING ENDS

A. Anchor railing ends to concrete and masonry with sleeves concealed within railing ends and anchored to construction with anchors and bolts.

3.5 CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

3.6 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in field to shop; make required alterations and refinish entire unit, or provide new units.

SECTION 057500 - DECORATIVE FORMED METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 PERFORMANCE REQUIREMENTS

A. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include finishing materials.

B. Samples for Verification: 6-inch- (150-mm-) long sample of actual unit and full size sample of prefabricated corner unit.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified fabricator.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing decorative formed metal similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver decorative formed metal products wrapped in protective coverings and strapped together in suitable packs or in heavy-duty cartons. Remove protective coverings before they stain or bond to finished surfaces.

B. Store products on elevated platforms in a dry location.

PART 2 - PRODUCTS

2.1 SHEET METAL

A. General: Provide sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections where exposed to view on finished units.

B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304 or 316L, stretcher-leveled standard of flatness.

2.2 MISCELLANEOUS MATERIALS

A. Filler Metal and Electrodes: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded or brazed and as necessary for strength, corrosion resistance, and compatibility in fabricated items.

1. Use filler metals that will match the color of metal being joined and will not cause discoloration.

B. Fasteners: Fabricated from same basic metal and alloy as fastened metal unless otherwise indicated. Do not use metals that are incompatible with materials joined.

1. Provide concealed fasteners for interconnecting decorative formed metal items and for attaching them to other work unless exposed fasteners are unavoidable or are the standard fastening method.

C. Construction Adhesive: Adhesive recommended by metal fabricator that will fully bond metal to substrate, and will prevent telegraphing and oil canning, and is compatible with substrate and noncombustible after curing.

2.3 PAINTS AND COATINGS

A. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 FABRICATION, GENERAL

A. Form metal to profiles indicated, in maximum lengths to minimize joints. Produce flat, flush surfaces without cracking or grain separation at bends. Ease edges.

B. Where welding or brazing is indicated, weld or braze joints and seams continuously. Grind, fill, and dress to produce smooth, flush, exposed surfaces in which joints are not visible after finishing is completed.

1. Use welding and brazing procedures that will blend with and not cause discoloration of metal being joined.

2.5 METAL BASE

A. Metal base 4 inches high unless indicated otherwise, designed for adhesive application to wall. Form metal base from metal of type and thickness indicated below:

1. Stainless-Steel Sheet: 0.063 inch (1.60 mm) thick.

a. Finish: No. 4.

B. Form base with 1/4-inch bend cove shoe. Provide pre-formed outside and inside corners with continuous shoe.

2.6 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Complete mechanical finishes of flat sheet metal surfaces before fabrication where possible. After fabrication, finish all joints, bends, abrasions, and other surface blemishes to match sheet finish.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.7 STAINLESS-STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain of directional finishes with long dimension of each piece.

C. Directional Satin Finish: No. 4.

D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of decorative formed metal.

B. Substrates shall be clean, dry, and free of any dirt, dust, or other contaminants. Painted substrates shall be fully cured according to paint manufacturer documentation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Adhere metal base to wall according to manufacturer instructions. Adhere base to wall only when temperature of wall is 60 degrees Fahrenheit or above.

B. Locate and place decorative formed metal items level and plumb and in alignment with adjacent construction. Perform cutting, drilling, and fitting required to install decorative formed metal.

1. Do not cut or abrade finishes that cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units as required.

C. Form tight hairline joints accurately fitted together and units in alignment.

D. Corrosion Protection: Apply bituminous paint or other permanent separation materials on concealed surfaces where metals would otherwise be in direct contact with substrate materials that are incompatible or could result in corrosion or deterioration of either material or finish.

3.3 ADJUSTING AND CLEANING

A. Unless otherwise indicated, clean metals by washing with clean water and soap, rinsing with clean water, and drying with soft cloths.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

3.4 PROTECTION

A. Protect finishes of decorative formed metal items from damage during construction period. Remove temporary protective coverings at time of Substantial Completion.

END OF SECTION 057500

SECTION 060140 INTERIOR WOODWORK REFINISH

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of stripping and refinishing wood work (hand rails and trim) as indicated on drawings and schedules, and as herein specified.

B. Work includes refinishing of interior exposed items and surfaces as indicted on the drawings.

C. “Varnish” as used herein means all coating systems materials, including emulsions, stains, sealers, fillers, & other applied materials whether used as prime, intermediate or finish coats.

1.3 QUALITY ASSURANCE:

A. Single Source Responsibility: Provide finish coat products produced by same manufacturer for each varnish system.

B. Field Samples: On designated interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 2 sq. ft. of surface until required sheen and texture are obtained; simulate finished lighting conditions for review of in-place work.

1.4 SUBMITTALS:

A. Inspection Report: Varnish manufacturer’s technical representative will inspect existing facility to confirm the existing varnish systems, and note substrates which require bond or barrier coating to render them compatible with specified varnish systems. Submit copy of report to Architect.

B. Product Data: Submit manufacturer's technical information including Varnish label analysis and application instructions for each material proposed

1.5 DELIVERY AND STORAGE:

A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:

1. Name or title of material.
2. Manufacturer's stock number and date of manufacture.
3. Manufacturer's name.
4. Contents by volume, for major pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Finish name and number.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.

C. Protect from freezing where necessary. Keep storage area neat and orderly. Remove oily rags and waste daily. Take precautions to ensure workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling and application of varnish.

1.6 JOB CONDITIONS:

A. Apply varnish only when temperature of surfaces to be varnish and surrounding air are between 45°F and 95°F for solvent varnish, unless otherwise permitted by paint manufacturer's printed instructions.

B. Do not varnish when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.

C. Ventilation: Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with manufacturer's instructions.

D. Dust and Contaminants:

1. Schedule coating work to avoid excessive dust and airborne contaminants.
2. Protect work areas from excessive dust and airborne contaminants during coating application and curing.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Paint Manufacturer: Subject to compliance with requirements, provide products of one of the following:

1. Benjamin Moore and Co. (Moore)
2. Glidden Professional. (Glidden)
3. PPG Industries, Inc. (PPG)
4. Sherwin-Williams Co. (S-W) (Duron, a regional division of S-W, is not acceptable)

2.2 MATERIALS

A. NOTE: Chemical products are sometimes sold under a common name. This usually means that the substance is not as pure as the same chemical sold under its chemical name. The grade of purity of common name substances, however, is usually adequate for stain removal work, and these products should be purchased when available, as they tend to be less expensive. Common names are indicated below by an asterisk (*).

B. Varnish: Linseed-tung modified phenolic spar varnish such as "Rexpar" (Sherwin Williams), or approved equal per the work requirements.

C. Solvent: Mineral spirits, turpentine or denatured alcohol.

1. Mineral Spirits:

a. A petroleum distillate that is used especially as a paint or varnish thinner.

b. Other chemical or common names include Benzine* (not Benzene); Naphtha*; Petroleum spirits*; Solvent naphtha*.

c. Potential Hazards: TOXIC AND FLAMMABLE.

d. Safety Precautions:
   1) AVOID REPEATED OR PROLONGED SKIN CONTACT.
   2) ALWAYS wear rubber gloves when handling mineral spirits.
   3) If any chemical is splashed onto the skin, wash immediately with soap and water.

e. Available from construction specialties distributor, hardware store, paint store, or printer's supply distributor.

2. Turpentine:
   a. Typically used as a solvent and thinner.
   b. Potential Hazards: TOXIC AND FLAMMABLE.
   c. Safety Precautions:
      1) Work in a well ventilated area.
      2) Observe safety rules as turpentine is flammable, and the fumes can trip an ionization smoke detection system.
      3) Store soiled cloths in a metal safety container to guard against spontaneous combustion.
      4) Available from hardware store or paint store.

3. Denatured Alcohol:
   a. Other chemical or common names include Methylated spirit*.
   b. Potential hazards: TOXIC AND FLAMMABLE.
   c. Available from hardware store, paint store or printer's supply distributor.
   d. Denatured alcohol should be a satisfactory substitute for ethyl alcohol for stain removing purpose.

D. Alternative Solvent: a mixture of 75% toluene, 24% acetone and 1% butyl acetate.

1. Toluene (C_7H_8):
   a. A liquid, aromatic hydrocarbon that resembles benzene but is less volatile, flammable and toxic;Is produced commercially from light oils from coke- oven gas and coal tar and from petroleum, and is used as a solvent, in organic synthesis and an antiknock agent for gasoline.
   b. Other chemical or common names include Toluol*.
   c. Potential Hazards: TOXIC AND FLAMMABLE.
   d. Available from chemical supply house, hardware store, paint store or printer's supply distributor.

2. Acetone (C_3H_6O):
   a. A volatile fragrant flammable liquid ketone used chiefly as a solvent and in organic synthesis.
   b. Other chemical or common names include Dimethyl ketone*; Propanone*.
   c. Potential Hazards: VOLATILE AND FLAMMABLE SOLVENT.
   d. Available from chemical supply house or hardware store.

3. Steel Wool: Grade 000 steel wool.

4. Clean, soft cloths.
5. Sandpaper: 3 grades, finest grade 00.
6. Shellac burn-in sticks.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Applicator must examine areas and conditions under which varnish work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been correct in a manner acceptable to Applicator.

B. Starting of varnish work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

C. Do not varnish over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION:

A. General: Perform preparation and cleaning procedures in accordance with varnish manufacturer's instructions and as herein specified, for each particular substrate condition.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be varnish. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and varnish.

1. After completing varnish operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Cleaning: Before applying varnish or surface treatments, clean substrates of substances that could impair bond of varnish, including dust, dirt, oil, grease, and incompatible varnish and encapsulants.

D. Surface Preparation of Previously Painted Surfaces: Clean and prepare surfaces to be varnished according to manufacturer's written instructions for each particular substrate condition and as specified.

E. Wood: Clean wood surfaces to be varnished of dirt, oil, or other foreign substances with scrapers, suitable solvent, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application. Fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.

3.3 STRIPPING VARNISH

A. Make sure work area is well ventilated and wear protective clothing and rubber gloves. Do not allow smoking in the work area. Place a fire extinguisher for Class B fires at entrances for emergency use.

B. Always rub along the grain of the wood.

C. Change cloths as often as necessary to be effective in cleaning.

D. Cleaning:

1. Wet steel wool with solvent and rub over the wood to remove varnish buildup and smooth out checked surface. Replace soiled steel wool frequently and continue the wiping process until a smooth evenly colored surface is achieved. Use no water on wood surface under any circumstances.
2. Work only one 4' square area at a time. Work area should be within a comfortable arms reach. Protect areas of wood and adjacent surfaces not to be refinished from solvent and other stripping operations.
3. This process is to remove the varnish buildup only. If solvent affects the stained color of the wood, discontinue use and use Alternative Solvent mixture listed under Materials.
4. Allow surface to dry thoroughly, no less than 24 hours.
5. Fill scratches and gouges with shellac burn-in sticks matching the color to the wood stain.

3.4 APPLICATION OF REFINISHING:

A. Apply full wet coat of varnish. Allow to dry thoroughly.

B. Sand out roughness with 6/0 open coat abrasive paper. Dust off thoroughly with air jet or vacuum and wipe with a tack cloth to remove all dust.

C. Apply final full wet coat of varnish. Follow manufacturer's instructions for obtaining final satin finish.

3.5 CLEAN-UP AND PROTECTION:

A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day. Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or damage finished surfaces.

B. Protection: Protect work of other trades, whether to be varnish or not, against damage by painting and finishing work until date of Substantial Completion. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

1. Provide “Wet Paint” signs to protect newly-painted finishes. Remove temporary protective wrappings provided by others for their work after completion of varnish.
2. At completion of work of other trades, touch-up & restore all damaged varnish surfaces.

END OF SECTION 060140

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

C. Timber: Lumber of 5 inches nominal (114 mm actual) or greater in least dimension.

D. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.
3. RIS: Redwood Inspection Service.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.

2. Fire-retardant-treated wood.
3. Power-driven fasteners.
4. Powder-actuated fasteners.
5. Expansion anchors.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
   3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
   4. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.
   1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less and a smoke developed index of 450 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
   1. Use treatment that does not promote corrosion of metal fasteners.
   2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
   3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
   4. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat items indicated on Drawings.

2.4 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and any of the following species:
   1. Application: Interior partitions not indicated as load-bearing and miscellaneous wood framing.
   2. Species:
      a. Mixed southern pine; SPIB.
      b. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
   1. Blocking.
   2. Nailers.
   3. Rooftop equipment bases and support curbs.
   4. Cants.
   5. Furring.
   6. Grounds.

B. For items of dimension lumber size, provide Construction or No. 2 and any of the following species:
   1. Mixed southern pine; SPIB.
   2. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
   3. Eastern softwoods; NeLMA.

C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
   1. Mixed southern pine; SPIB.
   2. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
   3. Eastern softwoods; NeLMA.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 PLYWOOD SUBSTRATE PANELS

A. Plywood Substrate Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.

B. Interior “Lid” Substrate Panels for Aluminum Composite Panels:
   1. Fire-Retardant-Treated Plywood, in thickness indicated.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
   1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in the Construction Code.

G. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.

Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

H. Unless indicated otherwise, where wood studs are indicated, provide nominal 2 x 4 wood stud framing at 16 inches (406 mm) on center.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

1. For stud partitions and walls, provide blocking for all wall-mounted door hardware.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

3.4 MISCELLANEOUS FRAMING INSTALLATION

A. General: Arrange studs so wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Anchor plates to supporting construction, unless otherwise indicated.

B. Construct corners and intersections with three or more studs. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

3.5 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, “Engineered Wood Construction Guide,” for types of structural-use panels and applications indicated.

1. Comply with applicable recommendations in APA Form No. T625C, “Wood Structural Panels over Metal Framing Design/Construction Guide,” for types of structural-use panels and applications indicated.

a. Provide ceiling sheathing attachment to cold formed steel framing in accordance with Table 1 for panel thickness, and rafter stud spacing.

B. Fastening Methods: Fasten panels as indicated below:

1. Ceiling “Lid” Substrate Panels:

a. Screw to cold-formed steel framing.

b. Space panels 1/8 inch (3 mm) apart at edges and ends.

c. Provide “Ply-Clips” of type and spacing as recommended by APA for standard, square edged plywood ceiling sheathing, where backing panel is anchored directly to trusses and framing members.

3.6 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 061600 – SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
2. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.3 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations from UL's “Fire Resistance Directory.”

2.2 WALL SHEATHING

A. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. CertainTeed Corporation; GlasRoc.
   b. G-P Gypsum Corporation; Dens-Glass Gold.

c. National Gypsum Company; Gold Bond e(2)XP.

d. Temple-Inland Inc.; GreenGlass

e. United States Gypsum Co.; Securock.

1. Type and Thickness: Type X, 5/8 inch (15.9 mm) thick, unless indicated otherwise.

2. Size: 48-inch width by length suitable for installation.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For wall and ceiling sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.

B. Screws for Fastening Gypsum Sheathing to Cold-Formed Steel Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

1. For (CFSF-NS) steel framing less than 0.0329 inch (0.835 mm) thick, use screws that comply with ASTM C 1002.

2. For (CFSF-S) steel framing from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick, use screws that comply with ASTM C 954.

C. Nails, Brads, and Staples: ASTM F 1667.

D. Power-Driven Fasteners: NES NER-272.

E. Wood Screws: ASME B18.6.1.

F. Screws for Fastening Wood Structural Panels to Cold-Formed Steel Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

1. For wall and roof sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

2.4 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing Board: Elastomeric, 100% solids, moisture-curing polyether joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated, and complying with requirements for elastomeric sealants specified in Division 7 Section “Joint Sealants.”

1. Provide polyether based, 100% solids, moisture-curing elastomeric sealant.

a. York “GreatSeal LT-100 Liquid Tape.

b. Degussa “Sonnelastic 150.”

c. STS Coatings “GreatSeal.”

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, “Fastening Schedule,” in the Construction Code.

D. Coordinate sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to cold-formed steel framing with screws.
2. Install boards with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
3. Install boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.

D. Horizontal Installation: Abut ends of boards over centers of studs, and stagger end joints of adjacent boards not less than one stud spacing. Attach boards at perimeter and within field of board to each steel stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.

E. Seal sheathing joints according to sheathing manufacturer's written instructions.

1. Apply polyether-based sealant with extended width nozzle for nominal 1-inch wide coverage to glass-mat gypsum sheathing board joints. Apply sealant to exposed fasteners

heads with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION 061600

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated, including cabinet hardware and accessories, and finishing materials and processes.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
2. Show locations and sizes of cutouts and holes for items installed in architectural woodwork.

C. Samples for Verification:

1. Solid-surfacing materials, 6 inches (150 mm) square.
2. Stainless steel countertop, exposed corner 6 inches (150 mm) square.

D. Woodwork Quality Standard Compliance: Provide proof of membership in AWI Quality Certification Program.

E. Qualification Data: For fabricator.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.

B. Installer Qualifications: Fabricator of products.

C. Quality Standard: Unless otherwise indicated, comply with “Architectural Woodwork Standards – 1st Edition, October 1, 2009 published jointly by Architectural Woodwork Institute (AWI), Architectural Woodwork Manufacturer’s Association of Canada (AWMAC), and Woodwork Institute (WI) for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

D. Accessibility Requirements: Where casework is indicated to comply with accessibility requirements, comply with the Department of Justice 2010 ADA Standards for Accessible Design and ICC/ANSI A117.1-2009.

E. Food Service Countertops: Comply per NSF/ANSI Standard 51, approved for use in all food zones.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.

B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. Avonite, Inc.; "Avonite."

b. E. I. du Pont de Nemours and Company; "Corian."
c. Formica Group, Div. of Fletcher Building; "Solid Surfacing."
d. Hanwha L&C; "Hanex."
e. LG Hausys America; "HI-MACS."
f. Samsung, Cheil Industries Inc.; "Staron."
g. Wilsonart LLC, Div. of Illinois Tool Works, Inc.; "Solid Surface."

2. Type: Standard type, unless Special Purpose type is indicated.
3. Thickness: 1/2-inch (13 mm).
4. Colors and Patterns: As selected by Architect from manufacturer's full range.
5. Physical Characteristics
   a. Fungal and Bacterial Resistance: No growth, per ASTM G 21 and G 22.
   b. Tensile Strength: 4000 psi minimum per ASTM D 638.
   c. Barcol Hardness: 56 minimum per ASTM D 2583.
   d. Izod Impact Resistance: 0.28 ft-lb/in minimum per ASTM D 256 Method A.
   e. Ball Impact Resistance: No fracture at 112 inch drop minimum per NEMA LD 3-3 (1/2 lb. ball on 1/2" material).
   f. Stain Resistance: Pass per ANSI Z124.3 and/or ANSI Z124.6.
   g. Boiling Water Resistance: No effect per NEMA LD 3-3 or ISSFA SST 8.1-00.
   h. High Temperature Resistance: No effect per NEMA LD 3-3 or ISSFA SST 9.1-00.
   i. Flame Spread: <25 per ASTM E 84.
   j. Smoke Developed: <400 per ASTM E 84.

C. Stainless-Steel Sheet (Countertop Cladding): ASTM A 666, Type 304, not less than 0.0625-inch nominal thickness, with No. 4 satin finish.

2.2 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section "Door Hardware." Provide all hardware necessary for complete and functioning cabinets whether included in specification or not.

A. Grommets for Cable Passage through Countertops: 2.5-inch (75-mm) OD, black, molded-plastic grommets and matching removable plastic caps with slot for wire passage.
   1. Grommet Size: To suit nominal 2 1/2-inch diameter hole, 2 9/32-inch inside diameter and 5/8 inch deep.
   2. Cap Size: 3-inch overall diameter, with a cord slot 7/8-inch wide.

B. Wire Management: Galvanized steel J-Hook type formed with rounded edges and designed to support data cable. Basis of Design is Erico "Caddy CAT." Provide basis of design or equivalent from ICC or Cooper Tools.
   1. Width: 2-inch unless indicated otherwise.

C. Stainless Steel Legs: Suitable for food service, 304 stainless steel with stainless or black ABS foot and top steel plate designed for attachment to wood countertop framing. Legs shall be rated for 300 pounds vertical loading minimum, each.

2.3 VINYL TRIM

A. Vinyl Trim: Provide vinyl trim over existing "blue" plastic laminate at existing wet bar.
   1. Products: Available products, but not limited by, include the following:
      a. Wall Vinyl Self Adhesive sheet available from TipTopSigns.com
         1) http://www.tiptopsigns.com/Wall-Vinyl-Self-Adhesive-Vinyl-p-2474.html
   2. Description: Self adhesive backing.
   3. Material and Finish: Manufacturer's full range of available colors.

2.4 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

C. Steel Plates and Angles: ASTM A36, shop primed, (field paint in Division 9 Section "Paints"). (miscellaneous clips etc.)

2.5 FABRICATION, GENERAL

A. Interior Woodwork Grade: Unless otherwise indicated, provide Premium-grade interior woodwork complying with referenced quality standard.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges.

D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

E. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
   1. Seal edges of openings in countertops with a coat of varnish.

2.6 STAINLESS STEEL COUNTERTOPS

A. Quality Standard: Comply with AWI Section 11 requirements for countertops.

B. Grade: Premium.

C. Type of Top: Stainless steel sheet-clad counter fabrication to conform to "Combination Material Tops."

1. Fabricate countertop substrate for cladding, including edge profiles, cutouts, and other elements to receive cladding. Construct of lumber and panel product conforming to AWI standard. Provide counter edge, integral backsplash, and other profiles indicated.

2. Provide cladding of stainless-steel sheet, ASTM A 666, Type 304, not less than 0.0625-inch nominal thickness, with No. 4 satin finish.

a. Weld shop-made joints, and grind and polish surfaces to produce uniform, directionally textured finish, free of cross scratches. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

b. Where field-made joints are required, provide hairline butt-joints mechanically bolted through continuous channels welded to underside at edges of joined ends. Keep field jointing to a minimum.

2.7 HARDWOOD RAIL ALTERATIONS

A. Remove, alter, repair and refinish existing transparent finish hardwood rails where indicated.

B. Mounting Brackets: **3" x 3" x 1 ½"** aluminum angle shapes, ASTM B 221 (ASTM B 221M), Alloy 6061-T6, painted black.

1. Fasteners: Stainless steel with black painted head.

C. Neatly cut existing rails to fit between existing storefront mullions in locations shown. Maintain a consistent 1/4-inch space between the rail ends and the mullions.

D. Refinish existing rails after cutting and repairs with compatible finish system, as approved.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8-inch in 96 inches (3 mm in 2400 mm).

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation.

F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
2. Install countertops with no more than 1/8-inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
3. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c..
4. Calk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."

G. Window Stools: Anchor securely by approved concealed method underside of window stools.

1. Align adjacent solid-surfacing-material window stool sections of multi-piece stools and form seams to comply with manufacturer's written recommendations using adhesive in color to match stools. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
2. Install window stools with no more than 1/8-inch in 96-inch sag, bow, or other variation from a straight line.
3. Caulk space between window stools and both window unit and wall jambs with sealant specified in Division 7 Section "Joint Sealants."

H. Hardwood Rails: Anchor securely using mounting brackets screw-attached to sides of existing aluminum storefront. Predrill and tap aluminum for fasteners. Predrill hardwood rails for screws. Maintain a consistent 1/4-inch space between the rail ends and the mullions.

I. Vinyl Trim: Prepare existing surfaces clean of debris. Completely conceal existing "blue laminate trim". Installation shall be smooth, without bubbling or creases. Minimize use of joints where possible.

3.2 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064023

SECTION 066400 - PLASTIC (FRP) PANELING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For plastic paneling and trim accessories, in manufacturer's standard sizes. For selected patterns show complete pattern repeat.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain plastic paneling and trim accessories from single manufacturer.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

C. Sanitary Standards for Food Preparation Areas: Smooth, non-absorbent, and easily cleanable, complying with the following:

1. United States Department of Agriculture (USDA) requirements for food preparation facilities, incidental contact.
2. Food and Drug Administration (FDA) Food Code wall surface characteristics.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (70°F) for 48 hours prior to installation.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PLASTIC SHEET PANELING

A. General: Gelcoat-finished, glass-fiber reinforced plastic panels complying with ASTM D 5319.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Crane Composites, Inc.
   b. Marlite.
   c. Nudo Products, Inc.
2. Nominal Thickness: Not less than 0.075 inch (1.9 mm).
3. Surface Finish: Molded pebble texture Smooth surface with filled grooves at 4 inches (102 mm) o.c. to resemble tile.
4. Color: White.

2.2 ACCESSORIES

A. Trim Accessories: Manufacturer's standard vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, and caps as needed to conceal edges.
   1. Color: Match panels.

B. Adhesive: As recommended by plastic paneling manufacturer.

C. Sealant: Single-component, mildew-resistant, silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Division 7 Section "Joint Sealants."

D. Outside Corner Guards:
   1. Stainless Steel Corner Guard: Snap-on type over continuous metal cleat or surface mount type fastened with flush matching stainless steel fasteners.
   2. Size: Full height of FRP corner.
   3. Finish: #4 brushed satin.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation.

B. Clean substrates of substances that could impair bond of adhesive, including oil, grease, dirt, and dust.

C. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.

D. Lay out paneling before installing. Locate panel joints so that trimmed panels at corners are not less than 12 inches (300 mm) wide.

1. Mark plumb lines on substrate at trim accessory and panel joint locations for accurate installation.
2. Locate trim accessories and panel joints to allow clearance at panel edges according to manufacturer's written instructions.

3.3 INSTALLATION

A. Install plastic paneling according to manufacturer's written instructions.

B. Install panels in a full spread of adhesive.

C. Install trim accessories with adhesive.

D. Fill grooves in trim accessories with sealant before installing panels and bed inside corner trim in a bead of sealant.

E. Maintain uniform space between panels and wall fixtures. Fill space with sealant.

F. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.

G. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION 066400

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated, including data indicating compliance with the applicable "Quality Assurance" requirements.

B. Installation Instructions: Manufacturer's current printed installation instructions.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

D. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.3 PERFORMANCE REQUIREMENTS

A. Plenum Rating: Provide glass and mineral-fiber insulation where indicated in ceiling plenums whose test performance is rated as follows for use in plenums as determined by testing identical products per "Erosion Test" and "Mold Growth and Humidity Test" described in UL 181, or on comparable tests from another standard acceptable to authorities having jurisdiction.

1. Erosion Test Results: Insulation shows no visible evidence of cracking, flaking, peeling, or delamination of interior surface of duct assembly, after testing for 4 hours at 2500-fpm (13-m/s) air velocity.
2. Mold Growth and Humidity Test Results: Insulation shows no evidence of mold growth, delamination, or other deterioration due to the effects of high humidity, after inoculation with Chaetomium globosium on all surfaces and storing for 60 days at 100 percent relative humidity in the dark.

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Wall Assembly Mockup: Provide thermal insulation work for exterior mockup specified in Division 3 Section "Architectural Precast Concrete" and as specified in Division 1 section "Quality Requirements."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not deliver foam-plastic board materials to Project site before installation time.
2. Do not expose to sunlight except to necessary extent for period of installation and concealment.
3. Protect against ignition at all times.
4. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation ("XPS"): ASTM C 578, of type and minimum compressive strength indicated below, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Dow Chemical Company.
   b. Owens Corning.
   c. Kingspan Insulation (Pactiv).
2. Type IV, 25 psi (173 kPa).

B. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

C. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

2.2 MINERAL-WOOL BOARD INSULATION

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Roxul Inc.
2. Owens Corning Thermafiber.

B. Foil-Faced, Mineral-Wool Board Insulation: ASTM C 612; faced on one side with foil-scrim or foil-scrim-polyethylene vapor retarder; with maximum flame-spread and smoke-developed indexes of 25 and 5, respectively, per ASTM E 84.

1. Nominal density of 4 lb/cu. ft. (64 kg/cu. m), Types IA and IB, thermal resistivity of 4.2 deg F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).

C. Unfaced, Mineral-Wool Board Cavity Insulation: Mineral wool board designed for rainscreen and cavity wall applications, ASTM C 612; with maximum flame-spread and smoke-developed indexes of zero per ASTM E 84; non-combustible per ASTM E 136.

1. Nominal density of 4.1 lb/cu. ft. (65 kg/cu. m), Types IVA and IVB, thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).
2. Moisture Absorption: ASTM C 1104, 0.03% **[0.07%]** or less.

1. Fiber Color: Dark, or manufacturer's standard black matte facer.

2.3 GLASS-FIBER BLANKET INSULATION (AT INTERIOR WALL PARTITIONS ONLY)

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. CertainTeed Corporation.
2. Guardian Building Products, Inc.
3. Johns Manville.
4. Knauf Insulation.
5. Owens Corning.

B. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics. Blankets produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

2.4 MINERAL-WOOL BLANKET INSULATION

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Roxul Inc.
2. Owens Corning Thermafiber.

B. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

C. Reinforced-Foil-Faced, Mineral-Wool Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less per ASTM E 84); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

2.5 VAPOR RETARDERS

A. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.6 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Perforated plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
b. Gemco; Perforated Base Insulation Hangers.

c. Durodyne; Dynastick Insulation Hangers PBH.
d. Midwest Fasteners, Inc.; Spindle.

2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.

3. Spindle: Coated, mild steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.

B. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. AGM Industries, Inc.; 90° Insulation Hangers.
b. Gemco; 90-Degree Insulation Hangers.

2. Angle: Formed from 0.030-inch- (0.762-mm-) thick, perforated, galvanized carbon-steel sheet with each leg 2 inches (50 mm) square.

3. Spindle: Coated mild steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.

C. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/4 inches (32 mm) square or in diameter.

1. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:

a. Ceiling plenums.
b. Attic spaces.

D. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space between face of insulation and substrate to which anchor is attached.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. AGM Industries, Inc.; Metal Spacing Clip.
b. Gemco; Clutch Clip.

E. Drive Insert Mechanically-Attached Anchor: Drive-in plastic anchor with threaded shank for pull-out resistance and large diameter insulation-retaining head equal to Hilti "IDP Insulation Anchor System." Provide length to suit application.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Hilti; IDP Insulation Anchor System.
b. Techneta; Insulation Anchor.

F. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. AGM Industries, Inc.; TACTOO Adhesive.
b. Gemco; Tuff Bond Hanger Adhesive.
c. Durodyne; PBA.
d. Midwest Fasteners, Inc.; IHA-177.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Division 04 Section “Unit Masonry.”

B. Mineral Wool Board Cavity Insulation: Install with closely fitting joints using compatible wall ties and retainers, or spindle type (impaling pin) anchors according to manufacturer's written instructions.

3.4 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
5. Where support offered by cavity framing is insufficient, provide supplementary support framing or materials for overhead installation of blanket insulation as recommended by blanket insulation manufacturer.
6. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
   a. Exterior Walls: Set units with facing placed toward interior of construction and as indicated on Drawings.

3.5 INSTALLATION OF CURTAIN-WALL AND SLOPE GLAZING INSULATION

A. Install board insulation in curtain-wall construction where indicated on Drawings according to curtain-wall manufacturer's written instructions.
   1. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass. Maintain cavity width of dimension indicated between insulation and glass.

3.6 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 072700 – VAPOR RETARDING AIR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.

B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.

C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with air barrier.

C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Wall Assembly Mockup: A mockup of exterior wall assembly, incorporating air barrier, is specified in Division 3 Section “Architectural Precast Concrete.” The mockup shall provide a simulation of the backup wall construction, and include external cladding (APC panels) and insulation. Provide air barrier work required for provision of the mockup.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store and handle materials per manufacturer instructions.

B. Protect stored materials from direct sunlight.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer. Do not apply in freezing conditions unless product is designed and tested for it.

1. Protect substrates from environmental conditions that affect air-barrier performance.
2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa), when tested according to ASTM E 283 ASTM E 783 or ASTM E 2357.

2.3 SELF-ADHERING SHEET AIR BARRIER

A. Modified Bituminous Sheet: 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick, cross-laminated polyethylene film with release liner on adhesive side.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Carlisle Coatings & Waterproofing Inc.; CCW-705.
   b. Grace, W. R. & Co. - Conn.; Perm-A-Barrier Wall Membrane.
   c. Henry Company; Blueskin SA or Blueskin SA LT.
   d. Meadows, W. R., Inc.; Air-Shield.
   e. Tremco Incorporated, an RPM company; ExoAir 110/110LT.
2. Physical and Performance Properties:
   a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference; ASTM E 2178.
   b. Tensile Strength: Minimum 250 psi (1.7 MPa); ASTM D 412, Die C.
   c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
   d. Puncture Resistance: Minimum 40 lbf (180 N); ASTM E 154.

e. Water Absorption: Maximum 0.15 percent weight gain after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.

f. Vapor Permeance: Maximum 0.05 perm (2.9 ng/Pa x s x sq. m); ASTM E 96/E 96M, Water Method (B).

2.4 ACCESSORY MATERIALS

A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier membrane.

B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer.

C. Counterflashing Strip: Modified bituminous 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 32 mils (0.8 mm) of rubberized asphalt laminated to an 8-mil- (0.2-mm-) thick, cross-laminated polyethylene film with release liner backing.

D. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

E. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.

F. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.

G. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch (0.5 mm) thick, and Series 300 stainless-steel fasteners.

H. Sprayed Polyurethane Foam Sealant: One- or two-component, foamed-in-place, polyurethane foam sealant, 1.5- to 2.0-lb/cu. ft. (24- to 32-kg/cu. m) density; flame-spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.

I. Modified Bituminous Transition Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.

J. Elastomeric Flashing Sheet: ASTM D 2000, minimum 50- to 65-mil- (1.3- to 1.6-mm-) thick, cured sheet neoprene with manufacturer-recommended contact adhesives and lap sealant with stainless-steel termination bars and fasteners.

K. Preformed Silicone-Sealant Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Corning Corporation; 123 Silicone Seal.

b. Momentive Performance Materials Inc.; US11000 UltraSpan.

c. Pecora Corporation; Sil-Span.

d. Tremco Incorporated, an RPM company; Spectrem Simple Seal.

L. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
2. Verify that concrete has cured and aged for minimum time period recommended by air-barrier manufacturer.
3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
4. Verify that masonry joints are flush and completely filled with mortar.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.

E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

F. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Install modified bituminous strips and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch (1.6 mm).

G. Bridge and cover isolation joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with overlapping modified bituminous strips.

H. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

I. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 INSTALLATION

A. General: Install modified bituminous sheets and accessory materials according to air-barrier manufacturer's written instructions and according to recommendations in ASTM D 6135.

1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous air-barrier sheet produced for

low-temperature application. Do not install low-temperature sheet if ambient or substrate temperature is higher than 60 deg F (16 deg C).

B. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.

1. Install modified bituminous strips centered over vertical inside corners. Install 3/4-inch (19-mm) fillets of termination mastic on horizontal inside corners.

C. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations with termination mastic and according to ASTM D 6135.

D. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier sheet on same day. Reprime areas exposed for more than 24 hours.

1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

E. Apply and firmly adhere modified bituminous sheets horizontally over area to receive air barrier. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.

1. Apply sheets in a shingled manner to shed water without interception by any exposed sheet edges.
2. Roll sheets firmly to enhance adhesion to substrate.

F. Apply continuous modified bituminous sheets over modified bituminous strips bridging substrate cracks, construction, and contraction joints.

G. Seal top of through-wall flashings to air-barrier sheet with an additional 6-inch- (150-mm-) wide, modified bituminous strip.

H. Seal exposed edges of sheet at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

I. Install air-barrier sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous air barrier.

1. Coordinate air-barrier installation with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.

J. Connect and seal exterior wall air-barrier membrane continuously to concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

K. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply modified bituminous transition strip so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.

1. Modified Bituminous Transition Strip: Roll firmly to enhance adhesion.

L. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, doors, and miscellaneous penetrations of air-barrier membrane with foam sealant.

M. At end of each working day, seal top edge of air-barrier material to substrate with termination mastic.

N. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

O. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending 6 inches (150 mm) beyond repaired areas in all directions.

P. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.4 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.

2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed Work, using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 072700

SECTION 074243 - COMPOSITE WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

B. Refer to 084413 Sloped Glazing System, for additional Composite Wall Panels.

1.2 DEFINITIONS

A. Aluminum Composite Wall Panel Assembly: Metal-faced composite wall panels, attachment system components, miscellaneous metal framing, and accessories necessary for a complete weathertight wall system.

B. Aluminum Composite (Wall Panel) Column Cover: Formed metal-faced composite panels, attachment system components, miscellaneous metal framing, and accessories necessary for a complete column cover system.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Metal-faced composite wall panel assemblies shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) of wall area when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).

C. Water Penetration Under Static Pressure: No uncontrolled water infiltration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).

D. Structural Performance: Provide metal-faced composite wall panel assemblies capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 330:

1. Wind Loads: Determine loads based on the indicated minimum design wind pressures, but in no case less than 20 lbs per square foot and 30 lbs per square foot minimum at parapet and corner units.
2. Deflection Limits: Metal-faced composite wall panel assemblies shall withstand wind loads with horizontal deflections no greater than 1/175 of the span at the perimeter and 1/60 of the span anywhere in the panel.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint

sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal-faced composite wall panel and accessory.

B. Shop Drawings: Show fabrication and installation layouts of metal-faced composite wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish among factory-, shop-, and field-assembled work.

1. Identify horizontal-exposure applications with gasket-reveal capped with silicone sealant.
2. Indicate weep and ventilation perforations at panel perimeters.
3. Show requirements for subframing and substrates provided under other Sections for Contractor coordination.
4. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:10):
   a. Flashing and trim.
   b. Anchorage systems.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Metal-Faced Composite Wall Panels: Minimum 12 x 12 inches (300 x 300 mm). Include fasteners, closures, and other metal-faced composite wall panel accessories.
   a. Composite Panels: Include four-way joint.
2. Trim and Closures: 12 inches (300 mm) long. Include fasteners and other exposed accessories.
3. Accessories: 12-inch- (300-mm-) long Samples for each type of accessory.

D. Coordination Drawings: Interior elevations and plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Wall panels and attachments.
2. Joint pattern continuity.
3. Stud framing.
4. Wall-mounted items.
5. Penetrations of wall by pipes and utilities.

E. Qualification Data: For installer.

F. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

H. Maintenance Data: For metal wall panels to include in maintenance manuals.

I. Warranties: Samples of special warranties.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Installer Qualifications: Fabricator of aluminum composite wall panels.

1. Installer's responsibilities include fabricating and installing aluminum composite wall panel assemblies and providing professional engineering services required.

2. Engineering Responsibility: Preparation of data for aluminum composite wall panels, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

C. Source Limitations: Obtain each type of metal-faced composite wall panel from single source from single manufacturer.

D. Fire-Test-Response Characteristics: Provide metal-faced composite wall panels (MCM = metal composite materials) and system components with the following fire-test-response characteristics as determined by testing identical MCM and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1. Surface-Burning Characteristics: Provide fire-retardant core metal-faced composite wall panels (MCM) with flame-spread index of 25 or less and smoke-developed index of 450 or less, per ASTM E 84.

E. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, metal-faced composite wall panel Installer, metal-faced composite wall panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal-faced composite wall panels including installers of doors, windows, and louvers.

2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

3. Review methods and procedures related to metal-faced composite wall panel installation, including manufacturer's written instructions.

4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.

5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal-faced composite wall panels.

6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.

7. Review temporary protection requirements for metal-faced composite wall panel assembly during and after installation.
8. Review wall panel observation and repair procedures after metal-faced composite wall panel installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, metal-faced composite wall panels, and other manufactured items so as not to be damaged or deformed. Package metal-faced composite wall panels for protection during transportation and handling.

B. Unload, store, and erect metal-faced composite wall panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Store metal-faced composite wall panels vertically, covered with suitable weathertight and ventilated covering. Store metal-faced composite wall panels to ensure dryness, with positive slope for drainage of water. Do not store metal-faced composite wall panels in contact with other materials that might cause staining, denting, or other surface damage. Do not allow storage space to exceed 120 deg F (49 deg C).

D. Retain strippable protective covering on metal-faced composite wall panel for period of panel installation.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal-faced composite wall panels to be performed according to manufacturer's written instructions and warranty requirements.

B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal-faced composite wall panel fabrication and indicate measurements on Shop Drawings.

1.8 COORDINATION

A. Coordinate metal-faced composite wall panel assemblies with rain drainage work, flashing, trim, and construction of studs, soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal-faced composite wall panel assemblies that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures, including rupturing, cracking, or puncturing.
      b. Deterioration of metals and other materials beyond normal weathering.
   2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal-faced composite wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL MATERIALS

A. Aluminum Sheet: Coil-coated sheet, ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
   1. Surface: Smooth, flat finish.
   2. Exposed Coil-Coated Finishes:
      a. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   3. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

2.2 PANEL ACCESSORIES

A. Panel Sealants:
   1. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal-faced composite wall panels and remain weathertight; and as recommended in writing by panel manufacturer.

2.3 MISCELLANEOUS METAL FRAMING

A. Sub-framing is provided in Division 5 Section “Cold-Formed Steel Framing - Structural” for sub-structure of composite panel system except where indicated otherwise.

2.4 MISCELLANEOUS MATERIALS

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by manufacturer for type of use and finish indicated.

B. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with

heads matching color of metal-faced composite wall panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.

2.5 METAL-FACED COMPOSITE WALL PANELS

A. General: Provide factory-formed and -assembled, metal-faced composite wall panels fabricated from two metal facings bonded, using no glues or adhesives, to solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment system components and accessories required for weathertight system.

1. Fire-Retardant Core: Noncombustible, with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

a. Flame-Spread Index: 25 or less.

b. Smoke-Developed Index: 450 or less.

2. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. ALPOLIC, Division of Mitsubishi Chemical America, Inc.; ALPOLIC/fr. VA 1st

b. Alcan Composites USA Inc.; Alucobond Plus.

c. Alcoa Inc.; Reynobond FR.

B. Aluminum-Faced Composite Wall Panels; **ACWP-2 (indoor), ACWP-3 (outdoor at entrance). Refer to 084413 Sloped Glazing System, for ACWP-1 (typical encapsulated insulation) and ACWP-4 (gutter area encapsulated insulation)** : Formed with 0.020-inch-(0.50-mm-) thick, coil-coated aluminum sheet facings.

1. Panel Thickness: 0.157 inch (4 mm) minimum.

2. Core: Fire-retardant.

3. Exterior Finish: 3-coat fluoropolymer.

a. Color: Match sample as selected by Architect from color range equivalent to Alpolic's complete stock and custom colors.

1) Number of Colors: 1.

2) Match sample:

a) PPG Industries, Inc "Champagne" UC82080XL with UC51132 Clear Coat

C. Attachment System Components: Formed from extruded aluminum.

1. Include manufacturer's standard perimeter extrusions with integral weather stripping, panel stiffeners, panel clips, and anchor channels.

2.6 ACCESSORIES

A. Wall Panel Accessories: Provide components required for a complete metal-faced composite wall panel assembly including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal-faced composite wall panels unless otherwise indicated.

B. Flashing and Trim: Unless thickness is indicated otherwise on drawings, Formed from 0.040-inch- (1.016-mm-) minimum thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc

alloy-coated steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal-faced composite wall panels.

2.7 FABRICATION

A. Available Manufacturer/Fabricators: Subject to compliance with requirements, manufacturers offering systems which may be incorporated in the work include, but are not limited to:
   1. High Standard, Inc.; Pembroke, Massachusetts (781-829-9007)
   2. Kanalco Ltd; Ontario, Canada (800-268-8139)
   3. Miller-Clapperton Partnership, Inc.; Smryna, Georgia (770-941-8281)
   4. Precision Walls, Inc.; Raleigh, North Carolina (919-832-0380)
   5. Stovall Company; Ashland, Virginia (804-798-1415)
   6. Universe Cladding Solutions; Bridgeton, Missouri (314-439-2800)

B. General: Fabricate and finish metal-faced composite wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

C. Fabricate metal-faced composite wall panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.

D. Metal-Faced Composite Wall Panels: Factory form panels in a continuous process with no glues or adhesives between dissimilar materials. Roll round faces to precise radius, accounting for joints to provide a true round column cover when installed. Trim and square edges of sheets with no displacement of face sheets or protrusion of core material.
   1. Form panel lines, breaks, and angles to be sharp and true, with surfaces free from warp and buckle.
   2. Fabricate panels with sharply cut edges, with no displacement of face sheets or protrusion of core material.
   3. Fabricate panels with panel stiffeners, as required to comply with deflection limits, attached to back of panels with structural silicone sealant or bond tape.
   4. Where vertical joint locations are not shown for column covers, fabricate so that a plane drawn through the joints would be parallel to the nearest dominant wall.
   5. Dimensional Tolerances:
      a. Length: Plus 0.375 inch.
      b. Width: Plus 0.188 inch.
      c. Thickness: Plus or minus 0.008 inch.
      d. Panel Bow: 0.8 percent maximum of panel length or width.
      e. Squareness: 0.2 inch (5 mm) maximum.

E. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, non-corrosive metal recommended by metal-faced composite wall panel manufacturer.
   a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal-faced composite wall panel manufacturer for application, but not less than thickness of metal being secured.

2.8 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal-faced composite wall panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal-faced composite wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal-faced composite wall panel manufacturer.

B. Examine roughing-in for components and systems penetrating metal-faced composite wall panels to verify actual locations of penetrations relative to seam locations of panels before panel installation.

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Framing: Install subgirts, base angles, sills, furring, and other miscellaneous wall panel support members and anchorage according to ASTM C 754 and metal-faced composite wall panel manufacturer's written instructions.

B. Install flashings and other sheet metal to comply with requirements specified in Division 7 Section “Flashing, Sheet Metal and Roofing Accessories.”

3.3 METAL-FACED COMPOSITE WALL PANEL INSTALLATION

A. General: Install metal-faced composite wall panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and subgirts unless otherwise indicated. Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal-faced composite wall panels.
2. Flash and seal metal-faced composite wall panels at perimeter of all openings. Do not begin installation until air barrier and flashings that will be concealed by panels are installed.
3. Install flashing and trim as metal-faced composite wall panel work proceeds.
4. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated or, if not indicated, as necessary for waterproofing.
5. Provide weathertight escutcheons for pipe and conduit penetrating exterior walls.

B. Fasteners:

1. Aluminum Wall Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior and aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action as recommended by metal-faced composite wall panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal-faced composite wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by panel manufacturer.

1. Prepare joints and apply sealants per requirements in Division 7 Section “Joint Sealants.”
2. Finished sealant joints shall have clean edges.

E. Attachment System Installation, General: Install attachment system required to support metal-faced composite wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.

1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
2. Do not begin installation until air barrier and flashings that will be concealed by composite panels are installed.

F. Support System Installation: Provide manufacturer's standard horizontal and vertical concealed continuous extruded retainers. Install support system at locations, spacings, and with fasteners recommended by manufacturer. Attach panels to wall by interlocking tracks with perimeter extrusions attached to wall panels. Fully engage integral gaskets and leave horizontal and vertical joints with open reveal.

1. Attach flush wall panels to perimeter extrusions by engaging panel edges and by attaching with manufacturer's standard structural silicone adhesive.
2. Install wall panels to allow individual panels to “free float” and be installed and removed without disturbing adjacent panels.

3.4 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal-faced composite wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's “Architectural Sheet Metal Manual.” Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal-faced composite wall panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m), non-accumulative, on level, plumb, and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING

A. Remove temporary protective coverings and strippable films, if any, as metal-faced composite wall panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal-faced composite wall panel installation, clean finished surfaces as recommended by panel manufacturer. Maintain in a clean condition during construction.

B. After metal-faced composite wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal-faced composite wall panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074243

SECTION 075316 - CHLOROSULFONATE-POLYETHYLENE (CSPE) ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

B. Membrane Waterproofing: For the Podium (Plaza), the membrane roofing under a sand-bed masonry paver system plaza.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:

1. Base flashings and membrane terminations.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of complying with performance requirements.

C. Product Test Reports: For components of roofing system, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Research/Evaluation Reports: For components of roofing system, from ICC-ES.

E. Field quality-control reports.

F. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Special warranty includes membrane roofing, base flashings, roofing accessories and other components of roofing system.
2. Warranty Period: 15 years from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Burkeline Roofing Systems.
2. Tremco Incorporated.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.3 CSPE ROOFING

A. CSPE: ASTM D 5019, Type 1, Grade 2, 45-mil- (1.1-mm-) thick, reinforced, flexible uncured sheet formed from CSPE, and as follows:

1. Exposed Face Color: White.

2.4 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.

B. Sheet Flashing: 45-mil- (1.1-mm-) thick, reinforced or 55-mil- (1.4-mm-) thick, non-reinforced CSPE, as recommended by roofing system manufacturer for intended use.

C. Bonding Adhesive: Manufacturer's standard.

D. Slip Sheet: Manufacturer's standard, of thickness required for application.

E. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer.

G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
2. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
3. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
4. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Install roofing and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.

3.4 ADHERED MEMBRANE ROOFING INSTALLATION

A. Adhere roofing over area to receive roofing, and install according to roofing system manufacturer's written instructions.

B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.

C. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.

E. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing.

F. Apply roofing with side laps shingled with slope of roof deck where possible.

G. Seams: Clean seam areas, overlap roofing, and weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation. Complete welding of seams within 24 hours of exposing CSPE sheet or before curing of CSPE sheet has begun. Weld seams as follows:

1. Weld Method: Hot air or solvent, as standard with membrane roofing system manufacturer.
2. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing sheet.
3. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
4. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

H. Seaming to Existing Cured CSPE:

1. Cleaning: Broom clean area, removing debris so it does not recontaminate surface. Wash surface of existing cured CSPE in area to be seamed with detergent, then rinse and dry thoroughly. Wipe surface of cured CSPE in seam area with methyl ethyl ketone, acetone, or other solvent as recommended by CSPE roofing manufacturer for final cleaning.
2. Conditioning: Remove surface cure on existing CSPE with xylene or 2 coats of manufacturer’s proprietary primer.
3. Weld Method: Hot air or solvent, as standard with membrane roofing system manufacturer.
4. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.

I. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.5 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation. Complete welding of seams within 24 hours of exposing CSPE sheet or before curing of CSPE sheet has begun.

E. Terminate and seal top of sheet flashings.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform special inspections of substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Architect.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

C. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.7 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

3.8 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: _____.
2. Address: _____.
3. Building Name/Type: _____.
4. Address: _____.
5. Area of Work: _____.
6. Acceptance Date: _____.
7. Warranty Period: _____.
8. Expiration Date: _____.

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
   a. lightning;
   b. fire;
   c. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
   d. faulty construction of vents, equipment supports, and other edge conditions and penetrations of the work;
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing

reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
6. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.

1. Authorized Signature: _____.
2. Name: _____.
3. Title: _____.

F. END OF SECTION 075316

SECTION 075323 - ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) GUTTER LINER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's “The NRCA Roofing and Waterproofing Manual” for definitions of terms related to roofing work in this Section.

B. Deck, Metal Deck, Roof, Roofing and Roof Deck: Built-In Gutter, as indicated on the drawing composed of welded steel bent plates.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7 as established by the VUSBC and loading indicated.

1. Corner Uplift Pressure: Per building code and values indicated on Structural Drawings.
2. Perimeter Uplift Pressure: Per building code and values indicated on Structural Drawings.
3. Field-of-Roof Uplift Pressure: Per building code and values indicated on Structural Drawings.

D. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a membrane roofing system, and that are listed in FM Approvals' “RoofNav” for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.

1. Fire/Windstorm Classification: Class 1A-60.
2. Hail Resistance: MH.

E. Static Uplift Testing: In addition to wind uplift requirements, system tested per FM 4474, UL 580 or UL 1897.

F. Accelerated Weathering Test: Demonstrate physical integrity over the working life of the roof based upon 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 155 or ASTM G 154.

G. Impact resistance: Resist impact damage based on the results of tests in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M, or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470.

H. Energy Performance: Provide roofing system with initial Solar Reflectance Index not less than 78 when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency.

I. Ponding: Ponding water shall not remain on the roof 24 hours after a rainfall event.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.

1. Base flashings and membrane terminations.
2. Tapered insulation, including slopes.
3. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
4. Include details of roofing membrane, roofing vapor retarder/air barrier membrane connection to wall air barrier system to accomplish continuous air barrier system for an airtight building enclosure.
5. Built-in gutter assembly between sloped glazing system.

C. Samples for Verification: For the following products, in manufacturer's standard sizes:

1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
2. Roof insulation.
3. Vapor retarder/air barrier.
4. Termination bars.
5. Six insulation fasteners of each type, length, and finish.
6. Six roof cover fasteners of each type, length, and finish.

D. Qualification Data: For qualified Installer and manufacturer.

E. Manufacturer Certificate: Signed by roofing manufacturer certifying that membrane roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of complying with performance requirements.
2. Materials Certification: Provide to the Architect the roofing manufacturer's certification that materials being furnished comply with specified ASTM and approved standards. The Architect shall receive a copy of the certification and give it to the Owner's full-time roofing inspector ("Roof Inspector") before roofing materials may be installed.
   a. Certification shall be received with roofing materials delivered to job site.
   b. The Architect shall give a copy of the certification to the Owner's representative at the final inspection.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.

G. Research/Evaluation Reports: For components of membrane roofing system, from the ICC-ES.

H. Maintenance Data: For membrane roofing system to include in maintenance manuals.

I. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Owner's Full Time Roofing Inspector: The Owner will retain a full time “Roof Inspector” as specified in the General Conditions. The Contractor shall schedule and coordinate work of the “Roof Inspector” and his own forces.

1. The Roofing Inspector shall check all materials and application procedures and prepare a daily written report covering such items as: the weather conditions, deck conditions, materials stored, and installation procedures including, bitumen temperature at kettle and point of application, etc. A copy of the daily report shall be given to the Contractor. The Inspector shall not permit installation of roofing materials without having first obtained from the Design Architect a copy of the Manufacturer's Certification confirming that the materials delivered for use on the project meet the specified ASTM Standards or other approved Standards.

B. Manufacturer Qualifications: A qualified manufacturer that is UL listed and FM Approvals approved for membrane roofing system identical to that used for this Project.

C. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

D. Source Limitations: Obtain components including roof insulation and fasteners for membrane roofing system from same manufacturer as membrane roofing or approved by membrane roofing manufacturer.

E. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

F. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency. Integrated Exterior Mockups: Attend preinstallation conference and provide EPDM membrane roofing work for integrated exterior mockup as specified in Division 1 section “Quality Requirements.”

H. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, mechanical contractor, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review materials certification and procedures.

3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
5. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

I. Inspection Reports of Roofing Manufacturer's Representative: Roofing manufacturer's representative shall inspect the work and provide copies of his inspection reports to the Architect and the Owner. The Installer shall notify manufacturer's representative of intended start date & schedule of roofing work.

1. The Installer and Roofing manufacturer's representative shall inspect the substrate surfaces (deck) to receive roofing system prior to beginning installation.
2. The roofing manufacturer's representative shall inspect the work no less than three times (startup, in-progress, and end-of-installation warranty inspection) during the application of the system & submit copies of inspection reports to the Architect & Owner within 7 days of the inspection.

J. Pre-Final Inspection Survey:

1. The Architect shall notify the Owner, Contractor and Roofing Contractor (in writing) that he has inspected the roof and finds it sufficiently complete to permit a roofing survey. In no case shall the survey be made earlier than forty days before the Final Inspection.
2. The Owner shall engage the services of an experienced, independent roof survey inspection service or laboratory, to survey the roof. The service shall use infrared or nuclear moisture detection methods, except if the method used requires roof probes or cuts, it shall not void the Contractor's two-year guarantee and the Manufacturer's Standard Warranty/Guarantee.
3. The Roofing Contractor shall cooperate and assist the inspection service by making and repairing any required cores, test cuts, or probes in such a way that Manufacturer's and Contractor's Warranty/ Guarantees are not voided.
4. A copy of the survey report shall be delivered to the Owner no later than ten days before the final inspection. Also, copies of all survey reports shall be delivered to the Owner, Architect, Contractor and Roofing Contractor.
5. The Owner shall pay for the service except that if the survey shows roofing deficiencies caused by improper materials, poor workmanship, or Contractor negligence, the Contractor, at his expense, shall repair or replace the roof and provide additional surveys

until the roofing work complies with the contract documents. All corrective work shall be completed before the final inspection.

6. Acceptance of the roofing system shall be contingent on a roofing survey report that indicates the presence of no detrimental amount of moisture; for example, moisture that would cause a significant lowering of the thermal resistance of the roof; etc.

K. Final Inspection Survey:

1. The following items must be presented to the Owner's representative at the final inspection:
   a. A copy of General Contractor's and Roofing Contractor's two year guarantee.
   b. A copy of the Roofing Manufacturer's Warranty/Guarantee.
   c. A copy of the Roofing Manufacturer's certification that roofing materials comply with specified ASTM Standards.
   d. Copies of the “History of Roofing Installation,” Sample Form "A"; and “Roof Information Worksheet - Single Membrane Roofing,” Sample Form "E." The Architect shall obtain forms from the Owner and complete all applicable items.
2. Remind the Owner of his responsibility to maintain and to inspect the roof at the following times:
   a. Semi-annually, as a condition of the roofing guarantee and State's maintenance policy.
   b. Between nine months and one year, closing the General Contractor's one year guarantee.
   c. Before the two year guarantee expires.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer's form, without monetary limitation (NDL or "no dollar limit"), in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Manufacturer's warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, other components of membrane roofing system.
2. Warranty Period: 20 years from date of Substantial Completion.

B. Special Project Warranty: Submit roofing warranty, on warranty form at end of this Section, signed by Installer and Contractor, covering Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners and vapor retarders for the following warranty period:

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EPDM MEMBRANE ROOFING

A. EPDM: ASTM D 4637, Type I, non-reinforced, uniform, flexible EPDM sheet.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Carlisle SynTec Incorporated.
   b. Firestone Building Products.
   c. Johns Manville.
   d. Versico Incorporated.
2. Thickness: 60 mil (1.5 mm), nominal.
3. Exposed Face Color: Black

2.2 AUXILIARY MEMBRANE ROOFING MATERIALS

A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Sheet Flashing: 60-mil- (1.5-mm-) thick EPDM, partially cured or cured, according to application.

C. Protection Sheet: Epichlorohydrin or neoprene non-reinforced flexible sheet, 55- to 60-mil- (1.4- to 1.5-mm-) thick, recommended by EPDM manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.

D. Bonding Adhesive: Manufacturer's standard.

E. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch- (75-mm-) wide minimum, butyl splice tape with release film.

F. Lap Sealant: Manufacturer's standard, single-component sealant**, colored to match membrane roofing**.

G. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.

H. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.

I. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer.

J. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

2.3 VAPOR RETARDER/AIR BARRIER

A. Self-Adhering, Vapor Retarder/Air Barrier Underlayment Sheet: Slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Thickness: 40 mil (0.0394”) minimum.
2. Air leakage: Less than 0.004 CFM/sq ft @1.6 lbs/sq ft (75 Pa.) per ASTM E283 or ASTM E 2178.
3. Vapor permeance: 0.05 perms maximum per ASTM E96.
4. Low temperature flexibility, -20 degrees F (-29 degrees C) per ASTM D1970: Pass.
5. Elongation: 200% per ASTM D412-modifed.
6. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
7. Adhesion: 3.0 lbs/in. width (525 N/m) minimum per ASTM D903 for plywood.

B. Available Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. Henry Company; “Blueskin RF200.”
2. Grace, W. R. & Co.; “Ice and Water Shield.”
3. Owens Corning; “WeatherLock.”

2.4 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Approvals-approved roof insulation.

1. Provide treated wood blocking, specified in Division 6 Section “Rough Carpentry,” as required for roofing system manufacturer’s approved installation details. Provide blocking required by roofing system manufacturer in excess of blocking indicated on Drawings at no additional cost to Owner.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 3, felt or glass-fiber mat facer on both major surfaces.

C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to obtain a final slope of at least 1/4 inch per 12 inches (1:48) unless otherwise indicated.

D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated, but no less than 1/4 inch per 12 inches and no less than 1/8" per 12 inches in valleys.

2.5 INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Cold Fluid-Applied Adhesive: Adhesive system and application shall be approved for FM 1-90 systems minimum, but not less than required for the indicated roof FM fire/windstorm classification. Provide one of the following types of cold fluid-applied adhesive formulated to adhere roof insulation to substrate

1. Bead-Applied Insulation Adhesive: Insulation manufacturer's recommended bead-applied, low-rise, one- or multi-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.
2. Full-Spread Applied Insulation Adhesive: Insulation manufacturer's recommended spray-applied, low-rise, two-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that surface plane flatness and fastening of steel gutter complies with requirements in Division 05 Section "Structural Steel Framing."

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 VAPOR RETARDER/AIR BARRIER INSTALLATION

A. Self-Adhering VB/ Underlayment: Install self-adhering sheet VB/underlayment, wrinkle free, over entire metal deck area in shingle fashion to shed water, with end laps of 6 inches minimum staggered 24 inches between courses. Overlap side edges 3 inches minimum.

1. Coordinate placement of VB/underlayment on metal roof deck with other components of the building envelope to accomplish the air-tightness of the building enclosure which constitutes the total air barrier system specified in Division 1 Section “Exterior Enclosure Air Barrier Requirements.”

3.4 INSULATION INSTALLATION

A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install preformed insulation shapes - saddles, crickets, tapered edges – where indicated and as required for effective drainage.

E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

G. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Mechanically fasten first layer of insulation to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to recommendations in FM Approvals' “RoofNav” and FM Global Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification. . Fasteners shall not penetrate bottom flanges of steel roof deck.

a. Remove fasteners which penetrate bottom flanges of exposed acoustical roof deck and replace with properly located fasteners as required. Restore exposed acoustical roof deck to Owner’s satisfaction.

2. Set each subsequent layer of insulation in cold fluid-applied insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 ADHERED MEMBRANE ROOFING INSTALLATION

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's “Thermoset Roof Assembly Design Guidelines.”

1. Install roofing system **TS-I-A-S**, according to roof assembly identification matrix and roof assembly layout illustrations in NRCA's “The NRCA Roofing and Waterproofing Manual” and to requirements in this Section.

B. Adhere membrane roofing over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll membrane roofing and allow to relax before installing.

C. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.

D. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

E. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.

F. In addition to adhering, mechanically fasten membrane roofing securely at terminations, penetrations, and perimeters.

G. Apply membrane roofing with side laps shingled with slope of roof deck where possible.

H. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping membrane roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of membrane roofing terminations.

I. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

J. Spread sealant or mastic bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.

K. Install membrane roofing and auxiliary materials to tie in to existing membrane roofing to maintain weather-tightness of transition.

L. Adhere protection sheet over membrane roofing at locations indicated.

3.6 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements. Repair or remove and replace roofing system where ponding occurs in excess of specified requirement.

D. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.9 ROOFING WARRANTY

WHEREAS

of (Address) _____

herein called the "Contractor," has provided roofing and associated "work" on the following project:

Owner: _____

Address: _____

Name of Building: _____

Address: _____

Area of Work: _____ Date of Acceptance: _____

Warranty Period: _____ Date of Expiration: _____

Roofing Contractor: _____

Address: _____

AND WHEREAS Contractor has contracted directly with the Owner to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE the (General) Contractor shall maintain the entire roof system in a completely water-tight condition at no cost to the Owner for two (2) years from date of final acceptance; except this water-tight guarantee shall not be enforced when the Contractor can prove water damage was caused by the Owner.

This guarantee covers the roofing membrane and flashing, metal flashing, parapet coping, and properly detailed penetrations of the roofing membrane for such things as stacks, curbs, and expansion joints which exist when the work is performed.

The Roofing Contractor shall guarantee its materials and workmanship associated with the roofing, flashings, and sheet metal work incidental to the work required under the roofing subcontract, against defect due to faulty materials or workmanship for a period of two (2) years from the date of completion of such work. It is understood and agreed by all parties hereto that the responsibility of the roofing contractor under this guarantee form or any contract document shall be limited to the limited guarantee herein expressed by said roofing contractor.

The undersigned named Owner for the Commonwealth agrees, from the date of acceptance of the project, to maintain the roof in accordance with the manufacturer's written requirements and agrees to avoid damage to the roof surface by any parties under his control working or walking on the roof. The Owner recognizes his responsibility to inspect the roof semi-annually.

IN WITNESS THEREOF, this instrument has been duly executed this

_____ day of _____, 20 _____.

General Contractor (Firm)

By:

Name

Authorized Signature

Roofing Contractor (Firm)

By:

Name

Authorized Signature

Owner

By:

Name

Authorized Signature

END OF SECTION 075323

SECTION 076201 – FLASHING, SHEET METAL AND GUTTER ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUBMITTALS

A. Product data: Manufacturer's technical product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

1. Submit confirmation that gutter edge systems conform to ANSI/SPRI ES-1 performance requirements.

B. Samples of specified fluorocarbon ("Kynar") factory finishes on substrate material for coping and gravel stop items. Provide samples of minimum 2-inch square size of full range of manufacturer's standard colors for selection.

C. Shop drawings showing layout, profiles, methods of joining, and anchorage details, including major counterflashings, gutters and down spouts conductor heads, copings, trim/fascia units and expansion joint systems. Note metal materials and gage. Identify work by others; Contractor is responsible for coordinating provision of all components included in accepted shop drawings. Provide layouts at 1:48 scale and details at 1:4 scale.

1. Provide shop drawings of special details.

1.3 QUALITY ASSURANCE

A. Integrated Exterior Mockups: Attend preinstallation conference and provide flashing work for integrated exterior mockup as specified in Division 1 section "Quality Requirements."

1.4 PROJECT CONDITIONS

A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 METALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:

1. Factory-Painted Aluminum Sheet: ASTM B 209, 3003-H14, with a minimum thickness of 0.040 inch, unless otherwise indicated.

2. Extruded Aluminum: ASTM B 221, alloy 6063-T52, with a minimum thickness of 0.080 inch for primary legs of extrusions that are anodized, unless otherwise indicated.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Solder: ASTM B 32, Grade Sn50, used with rosin flux.

B. Fasteners: Same metal as flashing/sheet metal or, other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

C. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.

D. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section “Joint Sealants.”

A. Epoxy Seam Sealer: 2-part non-corrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.

B. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gage required for performance.

C. Gutter and Conductor-Head Guards: 20-gage bronze or nonmagnetic stainless steel mesh or fabricated units, with selvaged edges and non-corrosive fasteners compatible with gutters and downspouts.

D. Rainwater Disperser: Provide surface-mounted mill-finish aluminum louver/grating fabrication for dispersing runoff water from sloping eaves. Fabricate in 5'-0" sections for snap-in installation in three mounting brackets per section. Provide “Rainhandler” device from Savetime Corp., Bridgeport CT (800-942-3004) or approved equivalent product.

2.3 FABRICATED UNITS

A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA “Architectural Sheet Metal Manual” (2012- 7th edition) and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded into hems.

1. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.
2. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of interlocking hooked flanges, minimum 1-inch deep, filled with mastic sealant (concealed in joints).
3. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, to meet SMACNA standards.

4. Separations: Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation recommended by fabricator.

2.4 REGLETS AND COUNTERFLASHINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Castle Metal Products.
   2. Cheney Flashing Company.
   3. Fry Reglet Corporation.
   4. Heckmann Building Products Inc.
   5. Hickman Company, W. P.
   6. Keystone Flashing Company, Inc.
   7. Metal-Era, Inc.
   8. Metal-Fab Manufacturing, LLC.
   9. National Sheet Metal Systems, Inc.

B. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
   1. Formed Aluminum: **0.050 inch (1.27 mm)** thick.
   2. Corners: Factory mitered and continuously welded.
   3. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.

C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches (100 mm) and in lengths not exceeding **12 feet (3.6 m)** designed to snap into reglets or through-wall-flashing receiver and compress against base flashings with joints lapped, from the following exposed metal:
   1. Formed Aluminum: 0.032 inch thick. Provide for applications at membrane roofing and gutter liner unless noted otherwise.

D. Accessories:
   1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
   2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

E. Aluminum Finish: Three-coat fluoropolymer
   1. Color: Match Architect's sample

2.5 ROOF DRAINAGE SYSTEMS – (SECONDARY, JOINTS ABOVE CEILING, UNDER PODIUM PLAZA)

A. Surface-Mount Gutter and Down Conductors: Provide .040" aluminum gutter fabrication per SMACNA standards (6th edition -2003), Figures noted, in minimum 20-foot- long sections, with bottom-outlet drain. Provide butt type gutter expansion joint with loose lock expansion joint cover cap detail between gutter sections, and formed cover plate per Figure 1-7. Provide continuous support cleat and gutter hangers per Figure 1-17. Provide aluminum or stainless steel wire ball strainers at outlets. Provide details, trim, and accessories to incorporate gutter fabrication into the roofing eave detail for leak-free installation.

1. Provide .030" aluminum 2-inch diameter down spouts of size indicated and height required. Provide down spout wall brackets at 8'-0" spacing maximum, minimum of one at top and bottom. Provide down spout outlet into downspout nozzle.
   a. Provide downspout wall brackets and downspout outlet into downspout nozzle.
   b. Provide prefabricated downspout elbows and offsets with shop formed and welded or brazed connections.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering roof drainage products that may be incorporated in the Work include, but are not limited to, the following:
   a. Advanced Architectural Metals, LLC.
   b. Architectural Products Co.
   c. Berger Brothers.
   d. Metal Era Corporation.
   e. Imetco Corporation.
   f. Perimeter Systems (Div. Southern Aluminum Finishing Co.).

B. Cast Bronze Downspout Nozzle: Provide exposed cast bronze nickel-bronze round downspout nozzle of size indicated to discharge from concealed drain leader. Nozzle shall have integral perimeter anchorage flange for mounting and manufacturer's standard bird screen. Subject to compliance with requirements, available products include, but are not limited to, the following:

1. Josam; 25010 Series.
2. Smith Manufacturing Co.; 1770 Series.
3. Wade; 3940 Series.
4. Zurn; Z-199 Series.

C. Conductor Heads and Down Conductors: Fabricate conductor heads of nominal dimensions indicated of design corresponding to Figure 1-25F of SMACNA standards (2003- 6th edition); or a fabricator's standard design acceptable to Architect. Provide indicated size down conductors, with wall brackets, etc., of matching material and finish. Fabricate conductor head of .032" aluminum with factory finish of color selected by Architect.

1. Provide downspout as specified with gutter.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA (2003- 6th edition) "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

B. Bed flanges of work in accordance with membrane roofing manufacturer's recommendations as required for waterproof performance.

C. Reglet/Counterflashing Applications: Install receiver/reglet pieces to receive counterflashing.

D. Surface-Applied One-Piece Counterflashing: Install surface applied counterflashing in manner & by methods indicated. Install counterflashing securely to substrate with neoprene foam tape if required and batten bar if required (not anticipated for 16 oz./sq. ft. copper), and fill reglet with mastic or elastomeric sealant, as indicated.

E. Conductor Heads & Down Conductors: Locate conductor heads and down conductors as indicated and coordinate work closely with adjoining sheet metal scupper, and other construction. Install (round) down conductors with welded brackets to columns & wall substrates indicated; coordinate with installation and finishing of column covers etc.

F. Surface Mounted Gutters & Down Conductors: Locate gutters and down conductors as indicated and coordinated with other construction. Coordinate gutters & continuous support cleat and hanger straps with roofing edge trim (fascia/gravel stop) forming counter flashing. Place and secure cover plate and expansion joint loose-lock cover pieces at butt type gutter expansion joints per SMACNA (2003 -6th edition) Figure 1-7.

   1. Secure down conductor straps to wall with Torx-head security fasteners.
   2. Install (round) down conductors with welded brackets to columns & wall substrates indicated; coordinate with installation and finishing of column covers etc.

G. Flexible Sheet Membrane Flashing (built-in gutter liners): Inspect metal frame and gutter construction for line & level. Locate drains as indicated & coordinated with other construction. Install fully adhered EPDM membrane on gutter substrate using preparation & adhesives recommended by membrane manufacturer. Coordinate work closely with adjoining sheet metal work including the sloped glazing system eave drip detail forming counter flashing to lap the gutter liner and the "coping" system outboard of gutter as indicated. Treat seams and bond ("weld") sheet material and flash to drains as recommended by manufacturer. Install mechanical fasteners, flashing etc., at locations and as recommended by manufacturer.

H. Rainwater Disperser: Provide for applications indicated, mounted appropriately to disperse sloping roofing rainwater runoff at eaves.

3.2 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Protection: Protect flashing and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering at time of Substantial Completion.

END OF SECTION 076201

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.

1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, and no alternative systems can be found, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

C. Qualification Data: For qualified Installer.

D. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:

1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.

2. Penetration firestopping, including sleeves and surrounding materials, is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:

a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.

b. Classification markings on penetration firestopping correspond to designations listed by UL in its "Fire Resistance Directory" or other agencies approved by authorities having jurisdiction.

C. Preinstallation Conference: Conduct conference at Project site. *

1.4 PROJECT CONDITIONS

A. Inspection: Inspect sleeves and pre-made openings for compliance with assembly requirements. Do not proceed where sleeves or surroundings differ from tested or approved assemblies.

B. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

C. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.5 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. A/D Fire Protection Systems Inc.
2. Hilti, Inc.
3. Nelson Firestop Products.
4. RectorSeal Corporation.
5. Specified Technologies Inc.
6. 3M Fire Protection Products.
7. Tremco, Inc.; Tremco Fire Protection Systems Group.

2.2 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).

1. Horizontal assemblies include floors.
2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.

3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

C. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

D. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

2.3 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings as well as all written and graphic requirements in the test assembly documentation for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

C. Install fill materials for firestopping by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

SECTION 078446 - FIRE-RESISTIVE JOINT SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: For each fire-resistive joint system. Include location and design designation of qualified testing agency.

1. Where Project conditions require modification to a qualified testing agency's illustration for a particular fire-resistive joint system condition, and no alternative systems can be found, submit illustration, with modifications marked, approved by fire-resistive joint system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

C. Qualification Data: For qualified Installer.

D. Installer Certificates: From Installer indicating fire-resistive joint systems have been installed in compliance with requirements and manufacturer's written recommendations.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fire-resistive joint systems.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, “Approval of Firestop Contractors,” or been evaluated by UL and found to comply with UL's “Qualified Firestop Contractor Program Requirements.”

B. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:

1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Fire-resistive joint systems are identical to those tested per testing standard referenced in “Fire-Resistive Joint Systems” Article. Provide rated systems complying with the following requirements:
   a. Fire-resistive joint system products bear classification marking of qualified testing agency.
   b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
      1) UL in its “Fire Resistance Directory.”
      2) Intertek ETL SEMKO in its “Directory of Listed Building Products.”

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Install and cure fire-resistive joint systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.5 COORDINATION

A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.

B. Coordinate sizing of joints to accommodate fire-resistive joint systems.

PART 2 - PRODUCTS

2.1 FIRE-RESISTIVE JOINT SYSTEMS

A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

B. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079:

1. Joints include those installed in or between fire-resistance-rated floor assemblies.
2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. A/D Fire Protection Systems Inc.
   b. Grace Construction Products.
   c. Hilti, Inc.
   d. Nelson Firestop Products.
   e. Passive Fire Protection Partners.
   f. RectorSeal Corporation.
   g. Specified Technologies Inc.
   h. 3M Fire Protection Products.
   i. Tremco, Inc.; Tremco Fire Protection Systems Group.

C. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
1. Color: Gray.

D. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to maintain ratings required. Use only

components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:

1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

3.3 INSTALLATION

A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings as well as all written and graphic requirements in the test assembly documentation for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.

2. Apply fill materials so they contact and adhere to substrates formed by joints.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Identify fire-resistive joint systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of joint edge so labels will be visible to anyone seeking to remove or penetrate joint system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   1. The words “Warning - Fire-Resistive Joint System - Do Not Disturb. Notify Building Management of Any Damage.”
   2. Contractor's name, address, and phone number.
   3. Designation of applicable testing agency.
   4. Date of installation.
   5. Manufacturer's name.
   6. Installer's name.

3.5 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which joints occur.

B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

END OF SECTION 078446

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

B. Refer to Division 08 Section “Sloped Glazing System” for additional Joint Sealants.

1.2 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

C. Provide joint sealants for interior STC-rated acoustical applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates, while maintaining indicated partition STC rating.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

E. Qualification Data: For Installer and testing agency.

F. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in “Quality Assurance” Article.

G. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

H. Field Test Report Log: For each elastomeric sealant application.

I. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

J. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

D. Product Testing: Obtain test results for “Product Test Reports” Paragraph in “Submittals” Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the commencement of the Work.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:
   a. Each type of elastomeric sealant and joint substrate indicated.
   b. Each type of non-elastomeric sealant and joint substrate indicated.
3. Notify Architect seven days in advance of dates and times when test joints will be erected. Architect’s presence at testing is not required.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
   a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.

1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Provide written report whether sealant in each type of joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.

6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

F. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

1.5 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period - Silicone: 20 years from date of Substantial Completion.
2. Warranty Period - Urethane: 5 years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.

2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

C. Low-Modulus Single-Component Neutral-Curing Silicone Sealant ES-1:
   1. Products:
      a. GE Silicones; SilPruf SCS2000.
      b. Pecora Corporation; 864. (or 890FTS for field-tint)
      c. Polymeric Systems Inc.; PSI-641.
      d. Sonneborn, Division of BASF; Omniseal.
      e. Tremco; Spectrem 3. (or Spectrem 4TS for field-tint)
   2. Type and Grade: S (single component) and NS (nonsag).
   3. Class: 50.
   4. Use Related to Exposure: NT (nontraffic).
   5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrate, O.
      a. Use O Joint Substrates: Aluminum coated with a high-performance coating, galvanized steel.

D. Medium-Modulus Single-Component Neutral-Curing Silicone Sealant ES-2:
   1. Products:
      a. Dow Corning Corporation; 795
      b. GE Silicones; SilPruf NB SCS9000.

c. Pecora Corporation; 895.
d. Tremco; Spectrem 2

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 50.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrate, O.
   a. Use O Joint Substrates: Aluminum coated with a high-performance coating, galvanized steel, and concrete.
6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.

E. Single-Component Mildew-Resistant Silicone Sealant ES-3:
1. Neutral-Curing Products:
   a. Pecora Corporation; 898.
   b. Tremco; Tremsil 600 White.
2. Acid-Curing Products:
   a. Dow Corning Corporation; 786 Mildew Resistant.
   b. GE Silicones; Sanitary SCS1700.
   c. Tremco; Tremsil 200 [White].
3. Type and Grade: S (single component) and NS (nonsag).
4. Class: 25.
5. Use Related to Exposure: NT (nontraffic).
6. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.
   a. Use O Joint Substrates: Galvanized steel and ceramic tile.

F. Non-Traffic Multicomponent Nonsag Urethane Sealant ES-4:
1. Products:
   a. Pecora Corporation; Dynatrol II.
   b. Tremco; Dymeric 240 FC.
   c. Schnee-Morehead, Inc.; Permathane SM 7200.
   d. Sika Corporation, Inc.; Sikaflex - 2c NS TG.
   e. Sonneborn, Division of BASF; NP 2.
   f. Tremco; Vulkem 227.
2. Type and Grade: M (multicomponent) and NS (nonsag).
3. Class: 25 minimum.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrate, O.

G. Multicomponent Pourable Urethane Sealant ES-5:
1. Products:
   a. Bostik Findley; Chem-Calk 550.

b. Meadows, W. R., Inc.; POURTHANE.
c. Pacific Polymers, Inc.; Elasto-Thane 227 Type I (Self Leveling).
d. Polymeric Systems Inc.; PSI-270SL.
e. Schnee-Morehead, Inc.; Permathane SM 7201.
f. Tremco; THC-901 or THC-900. (to suit slope)
g. Tremco; Vulkem 245.

2. Type and Grade: M (multicomponent) and P (pourable).
3. Class: 25.
4. Use Related to Exposure: T (traffic).
5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrate, O.

2.4 SOLVENT-RELEASE JOINT SEALANTS

A. Butyl-Rubber-Based Joint Sealant SRS-1: ASTM C 1311.
1. Available Products:
a. Bostik, Inc.; Chem-Calk 300.
b. Pecora Corporation; BC-158.
c. Tremco Incorporated; Tremco Butyl Sealant.

2.5 LATEX JOINT SEALANTS

A. Latex Sealant LS-1: Comply with ASTM C 834, Type P, Grade NF.

B. Products:
1. Bostik Findley; Chem-Calk 600.
2. Pecora Corporation; AC-20+.
3. Schnee-Morehead, Inc.; SM 8200.
4. Sonneborn, Division of BASF; Sonolac.
5. Tremco; Tremflex 834.

2.6 ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant AS-1: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Available Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. Accumetric LLC; BOSS 826 Acoustical Sound Sealant.
b. Grabber Construction Products; Acoustical Sealant GSC.
c. Pecora Corporation; AC-20 FTR or AIS-919.
d. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
e. USG Corporation; SHEETROCK Acoustical Sealant.

2.7 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), O (open-cell material), B (bi-cellular material with a surface skin), or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.8 ACOUSTIC JOINT PACKING MATERIALS

A. Mineral Wool Insulation

1. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
2. For use in sealing wall heads and around beam penetrations in concrete or concrete masonry unit walls, packed tight to no less than 8 pounds per cubic foot.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Fibrex Insulations Inc.
   b. Owens Corning.
   c. Roxul Inc.
   d. Thermafiber.

B. Elastomeric Closed Cell Neoprene Insulation

1. Closed cell neoprene insulation of thickness to suit joint width.
2. Available Manufacturers:
   a. AP Armaflex SS (Self Seal Insulation).
   b. AP Armaflex II Sheet and Roll Insulation.
   c. Aeroflex Aerocel.

2.9 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or

harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   a. Concrete.
   b. Masonry.
   c. Unglazed surfaces of ceramic tile. (work of Division 9 Section “Tiling.”)
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass. (work of Division 8 Section “Glazing.”)
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile. (work of Division 9 Section “Tiling.”)

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF PACKING MATERIALS

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

3.4 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

1. Provide sealant for all joints where sealant is not specified in other Sections. Seal all joints between dissimilar materials, unless indicated otherwise.
2. For interior partitions indicated to be full height, seal all penetrations and joints unless indicated otherwise.
3. Provide sealant on both sides of partitions unless indicated otherwise.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

1. For acoustic joints, comply with ASTM C919 – Standard Practice for Use of Sealants in Acoustical Applications

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.5 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed elastomeric sealant joints as follows:
   a. Perform 10 tests for the first 1000 feet of joint length for each type of elastomeric sealant and joint substrate.
   b. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation.
2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab in Appendix X1 in ASTM C 1193, as appropriate for type of joint-sealant application indicated.
   a. For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
4. Inspect tested joints and report on the following:
   a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
   b. Whether sealants filled joint cavities and are free of voids.
   c. Whether sealant dimensions and configurations meet specified requirements.
5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other

requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.6 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.7 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.8 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior vertical and horizontal non-traffic construction joints in cast-in-place concrete.
   1. Joint Sealant: Low Modulus Single-component neutral-curing silicone sealant ES-1.

B. Joint-Sealant Application: Exterior horizontal traffic isolation and contraction joints in cast-in-place concrete slabs.
   1. Joint Sealant: Multi-component pourable urethane sealant ES-5.

C. Joint-Sealant Application: Exterior vertical joints between different materials listed above.
   1. Joint Sealant: Low Modulus Single-component neutral-curing silicone sealant ES-1.

D. Joint-Sealant Application: Exterior perimeter joints between walls and frames of doors windows and louvers.
   1. Joint Sealant: Low or Medium Modulus Single-component neutral-curing silicone sealant ES-1 or ES-2.

E. Joint-Sealant Application: Vertical control and expansion joints on exposed interior surfaces of exterior walls.
   1. Joint Sealant: Non-Traffic, Multi-component nonsag urethane sealant ES-4.

F. Joint-Sealant Application: Interior perimeter joints of exterior openings.
   1. Joint Sealant: Non-Traffic, Multi-component nonsag urethane sealant ES-4.

G. Joint-Sealant Application: Interior joints between plumbing fixtures and adjoining walls, floors, and counters.
   1. Joint Sealant: Single-component mildew-resistant neutral or acid-curing silicone sealant ES-3.

H. Joint-Sealant Application: Vertical joints on exposed surfaces of interior concrete walls and partitions.
   1. Joint Sealant: Non-Traffic Multi-component nonsag urethane sealant ES-4.

I. Joint-Sealant Application: Vertical and perimeter joints on concealed surfaces of interior unit masonry, concrete, and panel full-height walls and partitions. Refer to other Division 9 Sections for acoustical sealant included as part of assembly installations.

   1. Joint Sealant: Acoustical Joint Sealant AS-1.

J. Joint-Sealant Application: Vertical and perimeter joints on exposed and concealed surfaces of interior unit masonry, concrete, and panel acoustic STC-rated walls and partitions. Refer to other Division 9 Sections for acoustical sealant included as part of assembly installations.

   1. Joint Sealant: Acoustical Joint Sealant AS-1.

K. Joint-Sealant Application: Perimeter joints between interior wall surfaces and frames of interior doors windows and elevator entrances.

   1. Joint Sealant: Latex sealant LS-1.

L. Joint-Sealant Application: Interior control, expansion, and isolation joints in horizontal traffic surfaces of concrete slab flooring

   1. Joint Sealant: Multi-component pourable urethane sealant ES-5.

M. Joint-Sealant Application: Bedding joint applications.

   1. Joint Sealant: Butyl-Rubber-Based Solvent-Release Joint Sealant SRS-1

END OF SECTION 079200

SECTION 079500 – EXPANSION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. Maximum Joint Width: Widest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.

B. Minimum Joint Width: Narrowest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.

C. Movement Capability: Value obtained from the difference between widest and narrowest widths of a joint opening typically expressed in numerical values (mm or inches) or a percentage (plus or minus) of nominal value of joint width.

D. Nominal Joint Width: The width of the linear opening specified in practice and in which the joint system is installed.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide factory-fabricated architectural joint systems capable of withstanding the types of loads and of accommodating the kinds of movement, and the other functions for which they are designed including those specified below, without failure. Types of failure include those listed in Appendix X3 of ASTM E 1399.

1. Pedestrian Traffic Joints: Support pedestrian traffic across joint.
2. Joints in Fire-Resistance-Rated Assemblies: Maintain fire-resistance ratings of assemblies.
3. Other Joints: Where indicated, provide joint systems that prevent penetration of water, moisture, and other substances deleterious to building components or content.
4. Joints in Surfaces with Architectural Finishes: Serve as finished architectural joint closures.

1.4 SUBMITTALS

A. Product Data: Include manufacturer's product specifications, construction details, material and finish descriptions, and dimensions of individual components and seals.

B. Shop Drawings: For each joint system specified, provide the following:

1. Placement Drawings: Include line diagrams showing entire route of each joint system, plans, elevations, sections, details, joints, splices, locations of joints and splices, and attachments to other Work. Where joint systems change planes, provide Isometric Drawings depicting how components interconnect to achieve continuity of joint covers and fillers.

C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each exposed metal and elastomeric material of joint system indicated.

D. Samples for Verification: Full-size units 6 inches (150 mm) long of each type of joint system indicated; in sets for each finish, color, texture, and pattern specified, showing the full range of variations expected in these characteristics.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain architectural joint systems through one source from a single manufacturer. Coordinate compatibility with adjoining joint systems specified in other Sections.

B. Fire-Test-Response Characteristics: Where indicated, provide joint systems incorporating fire barriers that are identical to those of assemblies tested for fire resistance per ASTM E 119 and ASTM E 814, including hose-stream test of vertical wall assemblies, by a testing and inspecting agency acceptable to authorities having jurisdiction.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of architectural joint systems and are based on the specific systems indicated. Other manufacturers' systems complying with requirements may be considered. Refer to Division 1 Section “Materials and Equipment.”

1. Do not modify intended aesthetic effects, as judged solely by Architect, without Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, those indicated in Part 2 “Architectural Joint Systems” Article.

2.2 MATERIALS

A. Aluminum: ASTM B 221, alloy 6063-T5 for extrusions; ASTM B 209, alloy 6061-T6 for sheet and plate.

1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.

B. Stainless Steel: ASTM A 666, Type 304 with No. 2B finish, unless otherwise indicated, for plates, sheet, and strips.

C. Strip Seals: Elastomeric membrane or tubular extrusions with a continuous longitudinal internal baffle system throughout complying with ASTM E 1783; used with compatible frames, flanges, and molded-rubber anchor blocks.

D. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint.

E. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, flexible moisture barrier and filler materials, drain tubes, lubricants, adhesives, and other accessories compatible with material in contact, as indicated or required for complete installations.

2.3 ARCHITECTURAL JOINT SYSTEMS

A. General: Provide joint systems of design, basic profile, materials, and operation indicated. Provide units with the capability to accommodate joint widths indicated and variations in adjacent surfaces.

1. Furnish units in longest practicable lengths to minimize number of end joints. Provide hairline mitered corners where joint changes directions or abuts other materials.
2. Include closure materials and transition pieces, tee-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous joint systems.
3. Frames for Strip Seals: Designed with semi-closed cavity that provides a mechanical lock for seals of type indicated.

B. Architectural Joint System – Indoor at floor finish level: Metal frames and covers for interior pedestrian traffic joints.

1. Available Products – (single filler flush floor system, 1-inch joint):
   a. Architectural Art Mfg.; Model C10-11-41 (floor-to-floor).
   b. Balco; Model 75FP-1 x 1 1/2 (floor-to-floor).
   c. C/S; Model GFTW-100 (floor-to-wall) & GFT-100 (floor-to-floor).
   d. MM Systems Corp.; Model FS-100 (floor-to-floor).
   e. InPro; Model 101-A01-025 (floor-to-floor).

C. Architectural Joint System – Indoor and outdoor below floor finish level (water resistant and fire barrier): UV-resistant premolded foam sized for compression fit, for exterior movement joints. Precompressed design for ease of installation, designed for adhesion using manufacturer's recommended adhesives.

1. Available Products (foam compression seal without retainers):
   a. Balco; BCS Series.
   b. Emseal; "Colorseal."
   c. LymTal; "Iso-Flex Precom C."
   d. InPro Corporation; "Foam Seal Series."

2.4 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.5 ALUMINUM FINISHES

A. Mill Finish: AA-M10 (Mechanical Finish: as fabricated; no other applied finish unless buffing is required to remove scratches, welding, or grinding produced in fabrication process.

B. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare substrates according to architectural joint system manufacturer's written instructions.

B. Coordinate and furnish anchorages, Placement Drawings, and instructions for installing joint systems to be embedded in or anchored to concrete or to have recesses formed into edges of concrete slab for later placement and grouting-in of frames.

C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary to secure joint systems to in-place construction, including threaded fasteners with drilled-in expansion shields for masonry and concrete where anchoring members are not embedded in concrete. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of joint systems.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for handling and installing architectural joint assemblies and materials, unless more stringent requirements are indicated.

B. Coordinate installation of architectural joint assembly materials and associated work so complete assemblies comply with assembly performance requirements.

C. Terminate exposed ends of exterior architectural joint assemblies with factory-fabricated termination devices to maintain waterproof system.

D. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required to install joint systems.

1. Install joint cover assemblies in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
2. Allow adequate free movement for thermal expansion and contraction of metal to avoid buckling.
3. Set covers in horizontal surfaces at elevations that place exposed surfaces flush with adjoining finishes.
4. Locate wall covers in continuous contact with adjacent surfaces.
5. Securely attach in place with required accessories.
6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.

E. Roof Expansion Joint Installation.

1. General: Comply with manufacturer recommendations and with applicable portions of Division 7 Section “Flashing, Sheet Metal and Gutter Accessories” for handling and installing roof expansion joints.

a. Anchor roof expansion joints securely in place, with provisions for required movement. Use fasteners, protective coatings, sealants, and miscellaneous items as required for complete roof expansion joint assembly.

b. Install roof expansion joints to fit substrates and to result in watertight performance.

c. Torch cutting of roof expansion joints is not permitted.

d. Do not use graphite pencils to mark aluminum surfaces.

2. Directional Changes and Other Expansion-Control Joint Systems: Coordinate installation of roof expansion joints with other expansion-control joint systems to result in watertight performance. Install shop-fabricated joint cover units at directional changes and at transitions between roof expansion joints and exterior expansion-control joint systems specified to provide continuous, uninterrupted, and watertight joints.

3. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

F. Continuity: Maintain continuity of joint systems with a minimum number of end joints and align metal members. Cut and fit ends to produce joints that will accommodate thermal expansion and contraction of metal to avoid buckling of frames. Adhere flexible filler materials, if any, to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.

G. Joint Systems with Seals: Seal end joints within continuous runs and joints at transitions according to manufacturer's written instructions to provide a watertight installation.

H. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and end joints.

3.3 CLEANING AND PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

END OF SECTION 079500