1230 W Boone Ave
Spokane, WA 99201
www.spokanetransit.com

INVITATION FOR BID

2024-10964

WHITWORTH COMFORT STATION

ISSUE DATE: **Sunday, January 12, 2025**

PROPOSAL DUE DATE: **Thursday, February 6, 2025**
3:30 PM Pacific Time

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SECTION 001100 – ADVERTISEMENT FOR BIDS

ADVERTISEMENT FOR BIDS

Sealed bids will be accepted for the following project:

Project No.:	2024-10964
Project Title:	Whitworth Comfort Station
Agency:	Spokane Transit Authority (STA) 1230 W Boone Ave. Spokane, WA 99201
Procurement Coordinator:	Haley Wilson hwilson@spokanetransit.com 509-325-6076
Public Bid Opening:	3:30 PM, February 6, 2025 Spokane Transit Authority Room TBD
Pre-Bid Walk-through:	2 PM, January 22, 2025 Whitworth University Ivanhoe Rd. between Hawthorne and N Whitworth Dr.
Project Summary:	This public works project consists of the construction of a restroom and maintenance building and new sidewalk for an existing bus stop.

Please direct all questions regarding this project to the Procurement Coordinator stated above.

Bidders may obtain electronic copies of plans and specifications from the Project Manager or at spokanetransit.com

State of Washington prevailing wage rates are applicable for this public works project located in Spokane County. Bidders are responsible to verify and use the most recent prevailing wage rates. The "Effective Date" for this project is the Bid Form due date above. The applicable prevailing wage rates may be found on the Department of Labor & Industries website located at:

https://fortress.wa.gov/lni/wagelookup/prvWagelookup.aspx.

No Bidder may withdraw their bid after the bid due date and time unless contract award is delayed for a period exceeding ninety (90) days.

The Agency reserves the right to accept or reject any or all bids and to waive informalities in the solicitation process.

Use of Minority and Women's Business Enterprise (MWBE) contractors and suppliers is encouraged, but not mandatory. Bidders may contact the Office of Minority and Women's Business Enterprise at http://OMWBE.wa.gov/ to obtain information on certified firms. Bidders may also utilize Veteran-owned Businesses at http://www.dva.wa.gov/program/certified-veteran-and-servicemember-owned-businesses.

Spokane Transit Authority is an Equal Employment Opportunity (EEO) organization which does not discriminate on the basis of race, color, creed, national origin, sex, sexual orientation, gender identity, or presence of any sensory, mental or physical disability in the consideration of contract award. The successful Bidder will be required to comply with all federal, state and local EEO laws and regulations.

Spokane Transit Authority assures nondiscrimination in accordance with Title VI of the Civil Rights Act of 1964. For more information, visit www.spokanetransit.com.

Upon request, alternative formats of this information will be produced for individuals with disabilities. The public bid opening facility is accessible for individuals using wheelchairs. For other accommodations, please call (509) 325-6094 (TTY WA Relay 711) at least forty-eight (48) hours in advance.

END OF SECTION 001100

SECTION 002100 – INSTRUCTIONS TO BIDDERS

DEFINITIONS

A. **Addenda** are written or graphic instruments, approved and issued by the Owner prior to the time designated for opening of bids, which amend, modify or interpret the solicitation documents by identifying additions, deletions, clarifications or corrections.

B. **Alternate** or **Alternate Bid** is the amount stated in the Bid to be added or deducted from the amount of the Base Bid if the corresponding change in project scope or materials or methods of construction described in the solicitation documents is accepted.

C. **Architect**, **Engineer** or **A/E** means a person or entity lawfully entitled to practice architecture or engineering, representing Owner within the limits of its delegated authority.

D. **Base Bid** is the sum stated in the Bid for which the Bidder offers to perform the work described as the Base, to which work may be added or deducted from sums stated in Alternate Bids (if any).

E. **Bid** is the submission of a complete and properly signed Bid Proposal Form together with a bid guarantee, when applicable, and the certifications and representations required to comply with this solicitation.

F. **Bidder** is one who submits a Bid for a Contract with the Owner for the Work described in the construction documents.

G. **Bid Proposal Form** is the form provided in Section 004213 of this solicitation.

H. **Contract** is the formal written executed agreement between Owner and Contractor authorizing Contractor to perform the Work in accordance with the Contract Documents.

I. **Contractor** is the Bidder who has been awarded a Contract to perform the Work in accordance with the Contract Documents.

J. **Contract Documents** means the Advertisement for Bids, Instructions to Bidders, executed Bid Proposal Form and Bidder certifications, Contract, General Conditions, Modifications to the General Conditions, Supplemental Conditions, Federal Terms & Conditions, Drawings, Specifications, any addenda and/or modifications thereof, any or all supporting documentation required by the above, special forms, or as requested by Owner.

K. **Federal Assistance** means project funding provided, in whole or in part, by the US Department of Transportation, Federal Transit Administration (“FTA”).

L. **Non-responsive Bid** means any Bid which fails to conform in all respects to the material requirements of this solicitation, imposes conditions which would modify requirements of this solicitation, or would limit a Bidder's liability to the Owner so as to give the Bidder an advantage over other Bidders as determined by the Owner.

M. **Owner** means the Spokane Transit Authority, “STA” or its authorized representative with the authority to enter into, administer and/or terminate the Work in accordance with the Contract Documents, and make related determinations and findings.

N. **Responsible Bidder** means a contractor who meets the criteria listed in RCW 39.04.350.

O. **Unit Price** is an amount stated in the Bid as a price per unit of measurement or materials or services as described in the construction documents as defined in the General Conditions of the Contract.

PART 1 - GENERAL

1.1 INTRODUCTION

A. Scope of Work. The general description and scope of work for the project can be found in Section 003100 of this solicitation.

B. Schedule. Work may begin when the Contractor receives a formal "Notice to Proceed." Contractor shall proceed with promptness and dispatch and shall complete the project within **90** calendar days beginning on the day of commencement as stated in a Notice to Proceed.

C. Public Records. Materials submitted in response to this competitive procurement shall become the property of Spokane Transit Authority. All received Bids shall be deemed public records as defined in Chapter 42.56 RCW *Public Records Act*. Any information in the Bid that the Bidder desires to claim as confidential and exempt from disclosure under the provisions of state law shall be clearly designated as "Confidential". Each page claimed to be exempt from disclosure must be clearly identified by the word "Confidential" printed on it. Marking the entire Bid exempt from disclosure will not be honored. STA will consider a Bidder's request for exemption from disclosure; however, STA will make a decision predicated upon state law and regulations. If any information is marked as Confidential in the Bid, it will not be made available until the affected Bidder has been given a reasonable opportunity to seek a court injunction against the requested disclosure. STA assumes no liability for disclosure of Confidential material submitted by Bidders. Bid submittals shall be considered public documents under applicable Washington state law and shall be available for inspection and copying by the public, except to the extent portions of the submittals are otherwise protected under applicable law. Each Bidder will be responsible for protecting any disclosure of its submittal under applicable law.

D. Request for Information. Any prospective Bidder desiring an explanation or interpretation of this solicitation, drawings, specifications, etc., must submit a request in writing to the A/E seven (7) calendar days before the bid due date. Oral explanations or instructions given before the award of Contract will not be binding. Any information given a prospective Bidder concerning a solicitation will be furnished promptly to all other prospective Bidders by addendum to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective Bidders.

E. Disadvantaged Business Enterprise. STA is committed to ensuring that all firms regardless of race, color, sex or national origin have equal opportunity to participate in STA contracts. Therefore, STA has established an annual agency goal for Disadvantaged Business Enterprise (DBE) participation in its contracting opportunities. In accordance with the legislative findings and policies set forth in Chapter 39.19 RCW, STA encourages participation in all of its contracts by Minority Business Enterprises (MBE), Women Owned Business Enterprise (WBE), and Minority Women Owned Business Enterprise (MWBE) firms certified by the Office of Minority and Women's Business Enterprises (OMWBE). Participation may be either on a direct basis in response to this solicitation or as a subcontractor to a contractor submitting bids. However, unless required by federal statutes, regulations, grants or contract terms referenced in the Contract Documents, no preference will be included in the evaluation of Bids, no minimum level of DBE/MBE/WBE/MWBE participation shall be required as a condition for receiving an award, and Bids will not be rejected or considered non-responsive on that basis. Any affirmative action requirements set forth in federal regulations or statutes included or referenced in the Contract Documents will apply.

1.2 PREPARATION OF BIDS – CONSTRUCTION

A. Bids must be: (1) submitted on the Bid Proposal Form, or copies thereof, furnished by Owner or Owner's agent, and (2) signed in ink. The person signing a Bid must initial each change appearing on any Bid Proposal Form. If the Bid is made by a corporation, it shall be signed by the corporation's authorized designee. The address of the Bidder shall be typed or printed on the bid form in the space provided.

B. The Bid Proposal Form may require Bidders to submit bid prices for one or more items on a varying basis, including: (1) lump sum base bid; (2) lump sum bid alternate prices; (3) unit prices; or (4) any combination of items 1 through 3 above.

C. If the solicitation includes alternate bid items, failure to provide a price on any Alternates may disqualify the Bid. If bidding on all items is not required, Bidders should insert the words "No Bid" in the space provided for any item on which no price is submitted.

D. Substitute bid proposals will not be considered unless this solicitation authorizes their submission.

1.3 BID PRICES

A. The bid prices shown for each item on the Bid Proposal Form shall include all labor, material, equipment, overhead and compensation to complete all of the work for that item.

B. The actual cost of building permit (only) and the public utility hookup fees will be a direct reimbursement to the Contractor or paid directly to the permitting agency by the Owner. Fees for these permits should not be included by the Bidder in the bid amount.

C. The Bidder agrees to hold all Bid prices for ninety (90) days from date of bid opening.

1.4 ADDITIVE OR DEDUCTIVE BID ITEMS

A. The low Bidder, for purposes of award, shall be the responsive Bidder offering the low aggregate amount for the Base Bid, plus Alternates selected by the Owner, and within funds available for the project.

B. The Bidder agrees to hold all Alternate prices for ninety (90) days from date of bid opening.

1.5 TAXES

A. Bid prices shall not include Washington State Sales Tax ("WSST"). However, all other taxes imposed by law shall be included in Bid prices. The Owner will include WSST in progress payments. The Contractor shall remit applicable WSST to the Department of Revenue and shall furnish proof of remittance to the Owner if requested.

B. NOTE: Contractor must bond for total contract amount including WSST.

1.6 BID GUARANTEE

A. When the sum of the Base Bid plus all Alternates is $35,000.00 or less, a bid guarantee is not required. When the sum of the Base Bid plus all Alternates is greater than $35,000.00, a bid guarantee in the amount of five percent (5%) of the Base Bid amount is required. Failure of the Bidder to provide a bid guarantee when required shall render the Bid non-responsive.

B. Acceptable forms of bid guarantee are: A bid bond, U. S. postal money order, or certified check or cashier's check made payable to Spokane Transit Authority. The Owner will return bid guarantees (other than bid bond) to unsuccessful Bidders as soon as practicable, but not sooner than the execution of a contract with the successful Bidder. The bid guarantee of the successful Bidder will be returned to the successful Bidder with its official notice to proceed with the Work.

C. The Bidder will allow ninety (90) days from the bid opening date for acceptance of its Bid by the Owner. The Bidder will return to Owner a signed Contract, insurance certificate and requisite bond(s) or bond waiver within fifteen (15) days after receipt of the Contract. If the apparent successful Bidder fails to sign all contract documents, provide the bond and insurance as required, or return the documents within fifteen (15) days after receipt of the Contract, the Owner may terminate the award of the Contract.

D. In the event a Bidder discovers an error in its Bid following the bid opening, the Bidder may request to withdraw its Bid under the following conditions:

1. Written notification is received by the Owner within twenty-four (24) hours following bid opening.

2. The Bidder provides written documentation of the claimed error to the satisfaction of the Owner within seventy-two (72) hours following the bid opening.

The Owner will approve or disapprove the request for withdrawal of the Bid in writing. If the Bidder's request for withdrawal of its Bid is approved, the Bidder will be released from further obligation to the Owner without penalty. If it is disapproved, the Owner may retain the Bidder's bid guarantee.

1.7 ACKNOWLEDGEMENT OF ADDENDA

Bidders shall acknowledge receipt of all addenda to this solicitation by identifying the addenda numbers in the space provided for this purpose on the Bid Proposal Form. Failure to do so may result in the bid being declared non-responsive.

1.8 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

A. The Bidder acknowledges that it has taken steps necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling and storage of materials; (2) the availability of labor, water, electric power and road; (3) uncertainties of weather, river stages, tides or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during the work. The Bidder also acknowledges that it has satisfied itself as to character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including exploratory work done by the Owner, as well as from the drawings and specifications made a part of this solicitation. Any failure of the Bidder to take the actions described and acknowledged in this paragraph will not relieve the Bidder from responsibility for estimating properly the difficulty and cost of successfully performing the work.

B. If Bidder is unable to attend the scheduled pre-bid meeting, please contact STA to arrange a separate site visit. **The site visit for this project is optional.**

1.9 PREVAILING WAGE

A. The Work for this project constitutes a public work under RCW 39.04 *Public Works*. In accordance with RCW 39.12 *Prevailing Wages on Public Works*, the Contractor shall pay the highest prevailing wage rate by trade or occupation as specified by the State of Washington, Department of Labor and Industries.

B. If this Project is subject to Federal Assistance, the Contractor shall pay the *greater* of prevailing wages paid in accordance with the Davis Bacon and Related Acts or RCW 39.12 *Prevailing Wages on Public Works.* See Section 007200.1 *Public Works General Conditions*.

1.10 SUBMISSION OF BIDS

A. Bids must be submitted on or before the time specified in the Advertisement for Bids or as extended by written addenda to this solicitation.

B. Bids shall be submitted in a sealed envelope addressed to the office specified in the Advertisement for Bids. Oral, telephonic, electronic or facsimile bids are invalid and will not receive consideration. The envelope shall have printed on the outside:

1. The project number and description.
2. The name and address of the Bidder.
3. Identification as Bid Proposal.

C. Prior to the bid opening, the Owner's representative will designate the official bid clock. Any part of the Bid or Bid modification not received prior to the times specified, per the designated bid clock, will not be considered and the Bid will be returned to the Bidder unopened.

D. A Bid may be withdrawn in person by the authorized representative of the Bidder before bid opening. The representative of the Bidder will be required to show ID and sign the bid summary sheet before the Bid will be released to Bidder.

E. Individuals with disabilities who wish to request special accommodation, (e.g., sign language interpreters, Braille, etc.) need to contact the Owner ten (10) working days prior to the scheduled bid opening.

1.11 CONSIDERATION OF BIDS

A. Owner shall have the right to reject any or all Bids, to reject Bids considered non-responsive, including but not limited to, Bids not accompanied by any required bid guarantee, Bidder certifications or data required by the solicitation, or a Bid not signed by the Bidder's authorized representative.

B. The Owner shall have the right to waive any informality or irregularity in any Bid received.

C. In the event that a single Bid is received, Owner will conduct a cost/price analysis of the Bid. This analysis will compare the price and quality of the proposed equipment with that involved in recent similar purchases with similar specifications made by this or other governmental agencies in an attempt to determine the competitive integrity of the submitted Bid.

1.12 BID RESULTS

After the bid opening, Bidders may obtain bid results from the Owner.

1.13 RESPONSIBLE BIDDER

A. To be considered a "Responsible Bidder", at the time of Bid submittal, Bidders must meet all requirements specified in Section 004512 *Bidder Responsibility Criteria*.

B. Supplemental Responsibility Criteria: In addition to the mandatory Bidder responsibility criteria, the Owner may adopt relevant supplemental criteria for determining Bidder responsibility applicable to a project which the Bidder must meet. Where applicable, such supplemental criteria shall be attached to this solicitation.

1. At least seven (7) days prior to the bid submittal deadline, a potential Bidder may request the Owner modify the supplemental responsibility criteria. The Owner will evaluate the information submitted by the potential Bidder and respond before the Bid submittal deadline. If the evaluation results in a change of the supplemental responsibility criteria, the Owner will issue an addendum to this solicitation identifying the new and/or modified criteria.

2. Upon Owner's request, the apparent low Bidder must supply the requested responsibility information within two (2) business days of request by Owner. Withholding information or failure to submit all the information requested within the time provided may render the Bid non-responsive.

3. Upon request of the Owner, a Bidder whose Bid is under consideration for award of Contract shall submit promptly satisfactory evidence of his/her financial resources, experience, organization, and equipment available for performance of the Contract on AIA Form A305 "Contractor's Qualification Statement" or similar form approved by the Owner.

C. Not-responsible Bidder Notification.

1. If the Owner determines that the apparent low Bidder is not responsible, the Owner will notify the Bidder of its preliminary determination in writing.

2. Within three (3) days after receipt of the preliminary determination, the Bidder may withdraw its Bid or request a hearing where the Bidder may appeal the preliminary determination and present additional information to the Owner.

3. The Owner will schedule a hearing within three (3) working days of receipt of the Bidder's request. The hearing members will include a STA Executive or their designee, and Project Manager.

4. The Owner will issue a final determination after reviewing information presented at the hearing.

5. If the Owner determines a Bidder to be not responsible, the Owner will provide, in writing, the reasons for the determination. If the final determination affirms that the Bidder is not responsible, the Owner will not execute a Contract with any other responsible Bidder until two (2) business days following submittal of the final determination to the not responsible Bidder.

6. The Owner's final determination is specific to this project and will have no effect on other or future projects.

1.14 CONTRACT AWARD

A. The Owner will evaluate Bid responsiveness and responsibility.

1. A Bid will be considered responsive if it meets the following requirements:
    a. It is received at the proper time and place.
    b. It meets the stated requirements of this solicitation.
    c. It is accompanied by a bid guarantee, when required.
2. A Bid will be considered responsible if it meets the following requirements:
    a. It is submitted by a licensed/registered contractor within the state of Washington at the time of bid opening and is not banned from bidding on Public Works projects as determined by the Department of Labor and Industries; and
    b. It meets the mandatory responsibility criteria established in RCW 39.04.350 for prime contractors and subcontractors and an overall accounting of the supplemental responsibility criteria established for the project.

B. The Owner reserves the right to accept or reject any or all Bids and to waive informalities.

C. The Owner may negotiate Bid price adjustments with the low responsive Bidder, including changes in the Contract Documents, to bring the Bid within the available funding per RCW 39.04.015.

D. The apparent low Bidder, for purpose of award, shall be the responsive and responsible Bidder offering the low aggregate amount for the Base Bid plus selected Alternates and meeting all other bid submittal requirements.

E. The Contract will only become effective when signed by the Owner. Prior to the Owner's signature, any and all costs incurred shall be the sole responsibility of the Bidder.

F. The Contractor must purchase and maintain insurance coverages as stated in Section 007200.1 *General Conditions*.

G. Note: AIA Payment Bond and Performance Bond forms (A312) are required. These forms will not be provided by the Owner.

1.15 CONTRACT DOCUMENTS

A. The Contract Documents under which it is proposed to execute this work consists of all material bound herein, plus any addenda incorporated into the documents.

B. The Contract Documents are intended to be mutually cooperative and to provide all details reasonably required for the execution of the Work. Any person contemplating the submission of a Bid shall have thoroughly examined all of the various parts of the Contract Documents, and should there be any doubt as to the meaning or intent of the Contract Documents, the Bidder should request in writing to the A/E at least seven (7) working days prior to bid opening, an interpretation thereof. Any interpretation or change in the Contract Documents will be made only in writing, in the form of an addendum to the Contract Documents and will be furnished to all prospective Bidders receiving a set of documents, who shall indicate receipt of same in the space provided on the Bid Proposal Form. The Owner will not be responsible for any other explanation or interpretation of said documents.

1.16 DISCREPANCIES & CONTRACT DOCUMENT REVIEW

A. The intent of Spokane Transit Authority and Federal Funded Project Contract Documents is to describe a complete Project. These Contract Documents are complimentary. What is required by one part of the Contract Documents shall be binding as if required by all.

B. In the event of a discrepancy between Spokane Transit Authority and Federal Funded Project Contract Documents, the Contractor will use the Contract Document that imparts the highest cost to their Bid and/or longest delay in their schedule. It is the responsibility of the Contractor to bring these discrepancies to the attention of the Architect as soon as they are discovered.

1.17 PROTEST PROCEDURES

STA maintains a set of protest procedures. If any Bidder desires this information, it may be obtained by calling STA's Senior Procurement Manager, at (509) 325-6032.

END OF SECTION 002100

4SECTION 003100 – PROJECT DESCRIPTION AND SCOPE OF WORK

PROJECT DESCRIPTION

This public works project consists of the construction of a restroom and maintenance building and new sidewalk for an existing bus stop.

PROJECT LOCATION

The project is located at Whitworth University on Ivanhoe Road between W Hawthorne Road and N Whitworth Drive.

PROJECT SCHEDULE

Complete work within ninety (90) days of issuance of Notice to Proceed.

PROJECT EXCLUSIONS

- Provision and installation of bus stop shelter.
- Provision and installation of select restroom fixtures as identified in the Plans and Specifications.
- Provision, installation and configuration of select secure access system components as identified in the Plans and Specifications.

PROJECT GENERAL SCOPE OF WORK

The project work generally consists of:

1. Obtain and pay for all jurisdiction permit fees to include preparation, submittal, and approval of required Traffic Control Plans. These jurisdiction permit fees will be reimbursable paid to the contractor by STA with no markup.
2. Perform/coordinate thorough public and private utility locates.
3. Provision of temporary traffic control.
4. Site work for demolition, grading and placement of sidewalk, bus stop pads and new building per plans and specifications.
5. Demolition, trenching, and asphalt patching for construction of new utility service connections.
6. Construction of new CMU building.
7. Remediation of adjacent irrigation and landscaping per plan and specification, as needed.
8. Installation of signage posts.
9. Record all “as-built” information for delivery to Owner as required for final closeout.
10. All other work as shown and specified in the associated plans and specifications.

PROJECT-SPECIFIC NOTES

- Allow access by representative of, and coordinate as needed with, STA’s contracted Geotechnical, Environmental and Special inspections consultant, Budinger & Associates, Inc. throughout the project.
- Complete all work in accordance with applicable codes, utility locating, rules and regulations, as set forth by Spokane County and the State of Washington.

- Contractor is responsible for the supply of all equipment, materials and labor, and otherwise doing all things necessary for or incidental to completion of the Project.
- Contractor is responsible for making arrangements for staging of materials and equipment, if necessary.
- Contractor shall be responsible for the removal of all trash and waste materials from this project. All items that are disposed of shall be approved by the Project Manager and/or designee. Damages resulting from Contractor negligence shall be repaired immediately at no cost to STA. The Contractor shall take all precautions necessary to protect private property and the public during the construction period.
- Prepare site-specific Traffic Control Plans to be approved by the jurisdictional authority when applying for work permits. Traffic control plans will also be provided to Whitworth University for review and input.
- All work will be subject to inspection and acceptance by STA's project manager or their designee prior to payment.
- STA reserves the right to increase or decrease the amount of related services listed in the scope of work for a fairly negotiated price.

END OF SECTION 003100

SECTION 004200 – BID SUBMITTAL CHECKLIST

This checklist ***must be completed in its entirety, executed and included*** with the submittal of your signed Bid Proposal Form. By executing below, the Bidder attests all referenced forms are accurate, complete and fully executed. Failure by Bidder to properly complete, execute and include this checklist and all referenced forms with its Bid Proposal Form shall render the Bid non-responsive and shall be grounds for rejection of the Bid.

CHECKLIST

- ☐ Section 004200 Bid Submittal Checklist
- ☐ Section 004213 Bid Proposal Form
- ☐ Section 004215 Bid Response Form
- ☐ Section 004512 Bidder Responsibility Criteria
- ☐ Section 004546.E Certificate of Wage Compliance
- ☐ Bid Guarantee See subsection 1.6 of Section 002100 Instructions to Bidders.
- ☐ Bid submitted in a sealed envelope identifying the following on the front of the envelope:
  - Project Name: Whitworth Comfort Station
  - Contract Number: 2024-10964
  - Bidder Name: XXX
  - Bidder Address: XXX

  If Bid is submitted via mail, the sealed envelope required above shall be in addition to the envelope used for mailing.

STATEMENT OF COMPLIANCE

The undersigned has reviewed and fully understands the required Bid Documents and this Bid Submittal Checklist and certifies that all required documents, as marked herein and required by the specifications, are included in its Bid Proposal.

Authorized Signature: _____ Date: _____

Name: _____ Title: _____

Bidder Name: _____

END OF SECTION 004200

SECTION 004213 – BID PROPOSAL FORM

Bidder Name: _____

Each Bid item below shall constitute an offer to STA as outlined herein. By executing below and submitting its Bid, Bidder acknowledges no Bidder may withdraw its Bid after the hour and date set for the bid opening except as permitted by Section 002100, Instructions to Bidders.

STA reserves the right to accept or reject any or all Bids within ninety (90) days of the Bid Due Date. Bidder understands and agrees any additional taxes, permits, bonds, business licenses, contractor registrations, prevailing wages, certifications and fees, and any other ancillary charges, as applicable, have been included in the respective Bid item.

Basis of Award. The "Lowest Bid" shall be lowest sum of the Base Bid, Bid Option(s) and accepted Alternates, if any. Award of Contract, if any, shall be to the responsive and responsible Bidder submitting the Lowest Bid.

In compliance with the Contract Documents, the following Bid Proposal is submitted:

BASE BID	**Project qualifies as Public Road Construction (Rule 171)**
	$
(Please print dollar amount in space above)	INCLUDE Washington State Sales Tax
TRENCH EXCAVATION SAFETY PROVISIONS	$
If the bid amount contains any work which requires trenching excavation exceeding a depth of four (4) feet, all costs for trench safety shall be included in the Base Bid for adequate trench safety systems in compliance with Chapters 39.04 RCW & 49.17 RCW and WAC 296-155-650.	(amount included in Base Bid)

UNIT PRICES	**Project qualifies as Public Road Construction (Rule 171)**	
Concrete Sidewalk per Spokane County Standard Plan A-4	Unit Price	UOM
	$	LF
(Please print dollar amount in space above)	INCLUDE Washington State Sales Tax	
Unit prices shall include full compensation for the cost of labor, materials, equipment, overhead, profit and any additional cost associated with the unit bid.		

The undersigned agrees to perform the Work in accordance with the Contract Documents as bid herein.

Signature: _____ Date: _____

Name: _____

END OF SECTION 004213

SECTION 004215 – BID RESPONSE FORM

Bidder Name: _____

The Bid shall constitute an offer to STA as outlined herein and in the Bid Proposal Form. No Bidder may withdraw its Bid following the Bid Due Date, except as allowed under Section 002100 – Instructions to Bidders.

1. EXAMINATION OF DOCUMENTS

   A. Having carefully examined all Contract Documents, **as well as the site and local conditions affecting the Work**, the undersigned proposes to perform all Work in accordance with the Contract Documents for compensation to be computed from prices submitted on the Bid Proposal Form.

   B. By executing this form, the Bidder acknowledges receipt of the following Addenda:

      Addendum No. _____ Addendum Date: _____

      Addendum No. _____ Addendum Date: _____

      Addendum No. _____ Addendum Date: _____

      Addendum No. _____ Addendum Date: _____

      Addendum No. _____ Addendum Date: _____

   C. STA reserves the right to reject any or all Bids, portions or parts thereof, and to waive minor informalities in the Bid process.

2. TIME FOR COMPLETION

   The Bidder agrees to coordinate the completion of all Work within 90 Days of receipt of the Notice to Proceed.

3. FREIGHT

   Bid prices shall include all freight costs to each project site and shall be FOB Destination.

4. ANTI-KICKBACK

   No officer or employee of STA, having the power or duty to perform an official act or action related to this Bid, shall have or acquire any interest in this submittal, or have solicited, accepted or granted a present or future gift, favor, service or other thing of value from or to any person involved in this Bid.

5. FEDERAL DEBARMENT

   The undersigned represents that the Bidder and all offices with any controlling interest herein are not currently, and have not previously, been on any debarred bidders list maintained by the United States Government.

6. UBI CERTIFICATION

   I CERTIFY that no final determination of violation of RCW 50.12.070(1)(b) or 82.32.070(1)(b) has been made by the Washington State Departments of Employment Security, Labor and Industries or Revenue respectively dated within two (2) years of the Bid Due Date. I understand further that no Bid may be submitted, considered or contract awarded for a public work to any person or entity that has a determination of violation of the above reference statutes within two (2) years from the date that a violation is finally determined and the Bid Due Date.

7. AWARD OF CONTRACT

A. If written notice of acceptance of all or part of this Bid is mailed, sent electronically or delivered to the undersigned within ninety (90) Days after the Bid Due Date, the undersigned will, within **fifteen (15) Days** after date of such notice, execute and deliver to Owner the Contract as specified and furnish all requisite documentation including, but not limited to, Certificates of Insurance (send to coi@spokanetransit.com) and Payment and Performance Bonds, as required. Payment & Performance Bonds must be submitted in their original form. Electronic copies will not be accepted.

B. If the undersigned fails to complete the above requirements, the Bidder's Guarantee shall be forfeited to the Owner.

I CERTIFY, to the best of my knowledge, the information contained in this Bid is accurate and complete and that I have the legal authority to commit this firm to a contractual agreement. I realize the final funding for any service is based upon budget levels and the approval of the Spokane Transit Authority's Board of Directors.

Bidder Name: _____
(as registered with the State of Washington)

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

1. BIDDER ADMINISTRATIVE INFORMATION

Company Name: _____
(as registered with the State of Washington)

Physical Address: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Primary Contact: _____

Phone: _____ Email: _____

Washington Contractor License No.: _____

Washington UBI No.: _____

Washington Industrial Insurance Account No.: _____

Federal Tax Identification No.: _____

2. BIDDER INSURANCE COMPANY

Agency Name: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Primary Contact: _____

Phone: _____ Email: _____

3. BIDDER SURETY

Surety Name: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Primary Contact: _____

Phone: _____ Email: _____

I certify the information above is true and correct:

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

BIDDER QUALIFICATION STATEMENT

The following statements of experience, personnel, equipment, and general qualifications of the Bidder are submitted with the assurance that the Owner can rely on its accuracy and truthfulness. If more space is required for your answers, please attach a continuation sheet(s) to the corresponding bid response page referencing the item number.

1. The Company has been in business continually since _____ (month & year).

2. The Company has experience equivalent to that required under this Invitation for Bid:

    a. As a prime contractor for _____ years.

    b. As a subcontractor for _____ years.

3. List below work previously completed that is equal to or greater than the scope and complexity of that required under this Invitation to for Bid.

Year	Project Name	Project Location	Contract $	Project Owner & contact info

4. List supervisory personnel and/or project manager(s) currently employed by the Bidder that will be responsible for the Work on this project. Attach a brief (1 page maximum) resume for each individual listed.

Name	Title	Experience (years)

5. List all projects and/or contracts the Bidder has undertaken in the previous five (5) years which have resulted in:

    a. Arbitration or litigation:

Year	Project Name	Project Location	Project Owner & contact info

    b. Claims and/or violations filed by the Federal Government and/or the State of Washington Department of Labor & Industries, Department of Revenue or Employment Security Department:

Year	Project Name	Project Location	Project Owner & contact info

    c. Liens filed by suppliers and/or subcontractors:

Year	Project Name	Project Location	Project Owner & contact info

I certify the information above is true and correct:

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

SUBCONTRACTOR LIST

The Owner requests the Bidder list subcontractors and consultants, if applicable, of each work discipline applicable to the performance of Work. If no subcontractors and/or consultants are listed, it will be considered the Bidder's affirmation that it does not intend to use any subcontractors and/or consultants in its performance of the Work.

For projects that are estimated to exceed $1 million dollars, in accordance with RCW 39.30.060, Bidders may submit (1) within one (1) hour after the Bid Due Date, the names of subcontractors with whom the Bidder, if awarded a Contract, will subcontract with for the performance of HVAC (heating, ventilation, and air conditioning), plumbing as described in RCW 18.106, and electrical as described in RCW 19.28, or to name itself for the work; and (2) within forty-eight (48) hours after the Bid Due Date, the names of subcontractors with whom the Bidder, if awarded a Contract, will subcontract with for the performance of structural steel installation and rebar installation.

For additional consultants and/or subcontractors, attach copies of the second page of this Subcontractor List.

Type of work: _____

Company Name: _____
(as registered with the State of Washington)

Physical Address: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Primary Contact: _____

Phone: _____ Email: _____

WA Contractor License No.: _____ WA UBI No.: _____

WA Industrial Insurance Account No.: _____ Federal Tax Id No.: _____

Type of work: _____

Company Name: _____
(as registered with the State of Washington)

Physical Address: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Primary Contact: _____

Phone: _____ Email: _____

WA Contractor License No.: _____ WA UBI No.: _____

WA Industrial Insurance Account No.: _____ Federal Tax Id No.: _____

Type of work: _____

Company Name: _____
(as registered with the State of Washington)

Physical Address: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Primary Contact: _____

Phone: _____ Email: _____

WA Contractor License No.: _____ WA UBI No.: _____

WA Industrial Insurance Account No.: _____ Federal Tax Id No.: _____

Type of work: _____

Company Name: _____
(as registered with the State of Washington)

Physical Address: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Primary Contact: _____

Phone: _____ Email: _____

WA Contractor License No.: _____ WA UBI No.: _____

WA Industrial Insurance Account No.: _____ Federal Tax Id No.: _____

Type of work: _____

Company Name: _____
(as registered with the State of Washington)

Physical Address: _____

Mailing Address: _____

Telephone: _____ Fax: _____

Primary Contact: _____

Phone: _____ Email: _____

WA Contractor License No.: _____ WA UBI No.: _____

WA Industrial Insurance Account No.: _____ Federal Tax Id No.: _____

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

CONSTRUCTION WORK PLAN

Upon receipt of a Notice to Proceed for construction, Contractor shall:

CONSTRUCTION WORK PLAN (PG 2)

Authorized Signature: _____ Date: _____

Printed Name and Title: _____

END OF SECTION 004215

SECTION 004512 – BIDDER RESPONSIBILITY CRITERIA

In accordance with RCW 39.04.350, a Bidder must meet the following responsibility criteria to be considered a responsible bidder and qualified to be awarded a public works project. The Bidder must at the time of bid submittal:

1. Have a certificate of registration in compliance with chapter 18.27 RCW;
2. Have a current state unified business identifier (UBI) number;
3. If applicable, have industrial insurance coverage for the Bidder's employees working in Washington as required in Title 51 RCW; an employment security department number as required in Title 50 RCW; and a state excise tax registration number as required in Title 82 RCW;
4. Have received training on the requirements related to public works and prevailing wage under this chapter and chapter 39.12 RCW. The training must be provided by the Department of Labor and Industries or by a training provider whose curriculum is approved by the Department. Bidders that have completed three (3) or more public works projects, have had a valid business license in Washington for three (3) or more years, and are listed on the Department of Labor and Industries exemption list are exempt from this training requirement;
5. Within the three (3) year period immediately preceding the date of the bid solicitation, not have been determined by a final and binding citation and notice of assessment issued by the Department of Labor and Industries, or through a civil judgment entered by a court of limited or general jurisdiction, to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW; and
6. Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3).

In accordance with RCW 39.06, a public works contractor must verify responsibility criteria for each first-tier subcontractor, and a subcontractor of any tier that hires other subcontractors must verify responsibility criteria for each of its subcontractors. Verification shall include that each subcontractor, at the time of subcontract execution, meets the responsibility criteria and possesses an electrical contractor license, if required by RCW 19.28, or an elevator contractor license, if required by RCW 70.87. This verification requirement, as well as the responsibility criteria, must be included in every public works contract and subcontract of every tier.

Providing the following information is **MANDATORY** in order to meet "Responsible Bidder" requirements. Failure to provide this information may disqualify your bid as being **"Non-Responsive".** *If your business is not required to have one of the following numbers, provide an explanation***.**

1. State of Washington Contractor Registration No._____
2. State of Washington Unified Business Identifier No._____
3. Employment Security Department No._____
4. State Excise Tax Registration No._____
5. Is the payment of Worker's Comp (Industrial Insurance) Premiums current? If your business does not have a Worker's Comp account with the WA State Dept of L&I, please explain why.
   [ ] Yes
   [ ] No (If No, you are not eligible to bid on this project)
   [ ] No Account – Explain why:_____
6. Are you disqualified from bidding on public works projects in the State of Washington?
   [ ] Yes (If Yes, you are not eligible to bid on this project)
   [ ] No

END OF SECTION 004512

SECTION 004546.E – CERTIFICATION OF COMPLIANCE WITH WAGE PAYMENT STATUTES

The Bidder hereby certifies that within the three-year period immediately preceding the Bid Due Date, the Bidder is not a "willful" violator, as defined in RCW 49.48.082, of any provision of Chapters 49.46, 49.48 or 49.52 RCW, as determined by a final and binding citation and notice of assessment issued by the State of Washington, Department of Labor and Industries or through a civil judgement entered by a court of limited or general jurisdiction.

I certify under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct:

Bidder Name: _____

Authorized Signature[1]: _____ Date: _____

Printed Name and Title: _____

City & State: _____

Company Type: ☐ Sole Proprietor ☐ Partnership[2] ☐ Joint Venture ☐ Corporation

State of Incorporation or formation: _____

[1] If a Corporation, the Bid must be executed in the corporate name by the president, vice-president, or any other corporate officer accompanied by evidence of authority to execute. If a Partnership, the Bid must be executed by a Partner.

[2] If a Partnership, provide name of firm under which business is transacted: _____

END OF SECTION 04546.E

SPOKANE TRANSIT AUTHORITY PUBLIC WORKS CONSTRUCTION CONTRACT 20XX-10XXX

This Contract is made by and between **XXX** ("Contractor") and the **Spokane Transit Authority** ("Owner") as of the last date of execution.

Contractor		**Owner**
Name Address City, State, Zip Contractor License #: UBI #: FEIN #:	 XXX-XXX-XXX XX-XXXXXXX	Spokane Transit Authority 1230 W Boone Ave Spokane, WA 99201

The Contractor and Owner agree as follows:

Project: (project name, location, and description)

Design Professional: (architect or engineer)
Address
City, St, Zip
Contact
Email
Phone

Contract Sum:

$ XXX,XXX.XX	Base Bid
$ XXX,XXX.XX	Alternate 1
$ XXX,XXX.XX	Alternate 2
$ XXX,XXX.XX	**TOTAL**

Unit prices:

Item	Units/limits	Unit Price
XXX	XXX	XXX
XXX	XXX	XXX
XXX	XXX	XXX

Allowances in Contract Sum:

Item	Units/Limits	Price
XXX	XXX	XXX
XXX	XXX	XXX
XXX	XXX	XXX

CONTRACT DOCUMENTS

Contract Documents include, but are not limited to:

A. This Contract executed by the Contractor and Owner;

B. Advertisement for Bid and all Bid documents;

C. General Conditions;

D. Modifications to General Conditions;

E. Federal Terms & Conditions;

F. Supplemental Conditions;

G. Drawings prepared by the Design Professional:

- List the drawing number range from page 1 to XXX and the date(s).

H. Technical Specifications;

- List the specifications number range from page 1 to XXX and the date(s).

I. Invitation for Bid (IFB)

J. Addenda: (list any/all addenda by number, date and quantity of pages)

Number	Issue Date	# of pages
XXX	XXX	XXX
XXX	XXX	XXX
XXX	XXX	XXX

K. Other documents identified as follows:

Description	Date	# of pages
XXX	XXX	XXX
XXX	XXX	XXX

PROJECT MANAGERS & COMMUNICATIONS

Any administrative or operational communications required under this Contract shall be directed to the Parties' representatives set forth below:

Contractor	Spokane Transit Authority
Contact Title Company Address City, ST ZIP E: email@ P: (XXX) XXX-XXXX	Name Capital Projects Manager Spokane Transit Authority 1230 W Boone Ave Spokane, WA 99201 E: @spokanetransit.com P: (509) XXX-XXXX

Communications to be given hereunder shall be deemed sufficient if given (1) in person; (2) by mail, postage prepaid; or (3) by email, addressed to the Parties' representative set forth above, or as may be revised by written notice in accordance with the Notices Section of this Contract.

NOTICES

All notices, requests, claims, demands and related communications shall be in writing and shall be signed by a person duly authorized to provide such notice. Notices permitted or requested to be given hereunder shall be deemed sufficient if given (1) in person; (2) by regular mail, postage prepaid; (3) by registered or certified mail, postage prepaid, return receipt requested; or (4) by email, addressed to the Parties' representative set forth below, or as may be revised by like notice from time to time.

All notices shall be deemed to have been duly received (1) when delivered in person; (2) three (3) business days after the date of mailing by regular mail, postage prepaid; (3) upon receipt after dispatch by registered or certified mail, postage prepaid; or (4) upon confirmation of a read receipt when transmitted by email.

Contractor	Owner
Contact Title Company Address City, ST ZIP E: email@	Spokane Transit Authority Attn: Contracts 1230 W Boone Ave Spokane, WA 99201 E: contracts@spokanetransit.com

[signatures on the following page]

SIGNATURES

The Parties affirm the individuals signing this Contract have been granted the authority to do so and by their signature affirm the Parties will comply with the terms and conditions of this Contract.

XXX	**Spokane Transit Authority**
By:	By: E. Susan Meyer
Title:	Title: Chief Executive Officer
Date: _____	Date: _____
	Attest:
	By: Dana Infalt
	Title: Clerk of the Authority
	Date: _____

The following Public Works General Conditions ("GC") are incorporated into the contract to which they are attached. Although these GC are organized consistent with the General Conditions for Washington State Facility Construction, the provisions herein are not identical. Please review these GC carefully.

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PART 1: GENERAL PROVISIONS

1.01 DEFINITIONS

Capitalized terms included in these GC which are not defined herein shall have the same meaning as defined in the document(s) to which these GC are attached.

A. **Application for Payment** means a written request submitted by Contractor to Owner or, if applicable, A/E for payment of Work completed in accordance with the Contract Documents and approved Schedule of Values, supported by such substantiating data as Owner or, if applicable, A/E may require.

B. **Architect**, **Engineer** or **A/E** means a person or entity lawfully entitled to practice architecture or engineering, representing Owner within the limits of its delegated authority.

C. **Award** means the formal decision by the Owner notifying a responsible Bidder with the lowest responsive Bid of the Owner's acceptance of the Bid and intent to enter into a contract with the Bidder.

D. **Bidder** means an individual, partnership, firm, corporation or joint venture submitting a Bid with the intent to enter into a contract with Owner for the completion of the Work.

E. **Business Day** means Monday through Friday, commencing at 12:00 AM and ending at 11:59 PM, unless noted otherwise.

F. **Change Order** means a written instrument signed by Owner and Contractor stating their agreement upon all of the following: (1) a change in the Work; (2) the amount of the adjustment in the Contract Sum, if any, and (3) the extent of the adjustment in the Contract Time, if any.

G. **Claim** means Contractor's exclusive remedy for resolving disputes with Owner regarding the terms of a Change Order or a request for equitable adjustment, as more fully set forth in Part 8.

H. **Contract Award Amount** is the sum of the Base Bid and any accepted Alternates.

I. **Contract Documents** means the Advertisement for Bids, Instructions for Bidders, executed Bid Proposal Form and Bidder certifications, Contract, GC, Modifications to the GC, Federal Terms & Conditions, Drawings, Specifications, all addenda and modifications thereof, all supporting documentation required by any of the above, or as requested by the Owner.

J. **Contract Sum** is the total amount payable by Owner to Contractor for performance of the Work in accordance with the Contract Documents. Except as described below, the Contract Sum includes all taxes imposed by law and properly chargeable to the Work. The Contract Sum does not include Washington State sales tax.

K. **Contract Time** is the number of Days allotted in the Contract Documents for achieving Substantial Completion of the Work.

L. **Contractor** means the person or entity who has agreed with Owner to perform the Work in accordance with the Contract Documents. Contractor's duties and obligations flow down and become duties and obligations of Subcontractors.

M. **Day(s)** shall mean a calendar day, commencing at 12:00 AM and ending at 11:59 PM, unless noted otherwise.

N. **Drawings** are the graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, and may include plans, elevations, sections, details, schedules and diagrams.

O. **Final Acceptance** means the written acceptance issued to Contractor by Owner after Contractor has completed the requirements of the Contract Documents, as more fully set forth in Section 6.09E.

P. **Final Completion** means that the Work is fully and finally complete in accordance with the Contract Documents, as more fully set forth in Section 6.09D.

Q. **Force Majeure** means those acts entitling Contractor to request an equitable adjustment in the Contract Time, as more fully set forth in Section 3.05A.

R. **L&I** means the State of Washington Department of Labor and Industries.

S. **Notice** means a written notice which has been delivered to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended or, if delivered or sent by registered or certified mail, to the last business address known to the party giving notice.

T. **Notice to Proceed** means a written notice from Owner to Contractor that defines the date on which the Contract Time begins to run.

U. **Owner** means the Spokane Transit Authority, STA or its authorized representative with the authority to enter into, administer and/or terminate the Work in accordance with the Contract Documents and make related determinations and findings.

V. **Person** means a corporation, partnership, business association of any kind, trust, company or individual.

W. **Prior Occupancy** means Owner's use of all or parts of the Project before Substantial Completion, as more fully set forth in Section 6.08A.

X. **Progress Schedule** means a schedule of the Work, in a form satisfactory to Owner, as further set forth in Section 3.02B.

Y. **Project** means the total construction of which the Work performed in accordance with the Contract Documents may be the whole or a part and which may include construction by Owner or by separate contractors.

Z. **Project Manual** means the volume usually assembled for the Work which may include the bidding requirements, sample forms, and other Contract Documents.

AA. **Project Record** means the separate set of Drawings and Specifications as further set forth in Section 4.02A.

BB. **Schedule of Values** means a written breakdown allocating the total Contract Sum to each principal category of Work, in such detail as requested by Owner.

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

DD. **Subcontract** means a contract entered into by Subcontractor for the purpose of obtaining supplies, materials, equipment or services of any kind for or in connection with the Work.

EE. **Subcontractor** means any person, other than Contractor, who agrees to furnish or furnishes any supplies, materials, equipment or services of any kind in connection with the Work.

FF. **Substantial Completion** means that stage in the progress of the Work when the construction is sufficiently complete, as more fully set forth in Section 6.07A.

GG. **Work** means the construction and services required by the Contract Documents, and includes, but is not limited to, labor, materials, supplies, equipment, services, permits and the manufacture and fabrication of components, performed, furnished or provided in accordance with the Contract Documents.

1.02 ORDER OF PRECEDENCE

A. Any conflict or consistency in the Contract Documents shall be resolved by giving the documents precedence in the following order:

1. Federal Terms & Conditions, if applicable.
2. Executed Change Order(s), in descending order.
3. Executed Form of Contract.
4. Supplemental Conditions, if applicable.
5. Modifications to the GC, if applicable.
6. GC.
7. Specifications. Provisions in Division 1 shall take precedence over provisions of any other Division.
8. Drawings. In case of conflict within the Drawings, large scale drawings shall take precedence over small scale drawings.
9. Signed and Completed Bid Form.
10. Instructions to Bidders.
11. Advertisement for Bids.

1.03 EXECUTION AND INTENT

Contractor makes the following representations to Owner:

A. **Contract Sum Reasonable**. The Contract Sum is reasonable compensation for the Work and the Contract Time is adequate for the performance of the Work, as represented by the Contract Documents;

B. **Contractor Familiar with Project**. Contractor has carefully reviewed the Bid Documents, Contract Documents, visited and examined the Project site, become familiar with the local conditions in which the Work is to be performed, and satisfied itself as to the nature, location, character, quality and quantity of the Work, the labor, materials, equipment, goods, supplies, work, services and other items to be furnished and all other requirements of the Contract Documents, as well as the surface and subsurface conditions

and other matters that may be encountered at the Project site or affect performance of the Work or the cost or difficulty thereof;

C. **Contractor Financially Capable**. Contractor is financially solvent, able to pay its debts as they mature, and possesses sufficient working capital to complete the Work and perform Contractor's obligations required by the Contract Documents; and

D. **Contractor Can Complete Work**. Contractor is able to furnish the plant, tools, materials, supplies, equipment and labor required to complete the Work and perform the obligations required by the Contract Documents and has sufficient experience and competence to do so.

PART 2: INSURANCE AND BONDS

2.01 GENERAL INSURANCE REQUIREMENTS

At the Contractor's own expense, the Contractor shall procure and maintain for the duration of the Contract commercial insurance against claims for injuries to persons or damages to property that may arise from or in connection with the Contractor's own work, including the work of the Contractor's agents, representatives, employees, and Subcontractors of any tier. Contractor shall include in its Bid the cost of all insurance and bond costs required to complete the base Bid work and accepted alternates.

A. **Evidence of Insurance**. Within ten (10) Days of execution of a contract or prior to commencement of the Work, whichever occurs earlier, Contractor shall submit a Certificate of Insurance evidencing the minimum insurance coverages and limits specified hereunder to Owner at coi@spokanetransit.com. If the Contractor maintains higher limits than those specified herein, the Owner shall be entitled to the higher limits maintained by the Contractor. Owner reserves the right to receive a certified and complete copy of all of the Contractor's insurance policies and the Contractor shall furnish such copies within ten (10) Days of request by Owner. All insurance certificates shall name Owner's Contract number, Project number and Project title.

B. **Insurer Minimum Requirements**. All insurance policies shall be written with insurance companies licensed to provide insurance in the State of Washington and shall have a rating of not less than A:VII according to the A.M. Best Company.

C. **Deductible**. The Contractor is responsible for declaring to the Owner and paying any deductible or self-insured retention that is required by any of the Contractor's insurance. If the Owner is required to contribute to the deductible or self-insured retention under any of the Contractor's insurance policies, the Contractor shall reimburse the Owner the full amount of the deductible or self-insured retention.

D. **Self-insured Retention**. Any Contractor self-insured retentions must be declared to and approved in writing by Owner prior to execution of a Contract. Owner reserves the right to require that self-insured retentions be eliminated, lowered or replaced by a deductible. Self-insurance or self-insured retentions will not be considered to comply with these insurance requirements unless specifically approved in writing by Owner.

E. **Owner as Additional Insured**. Owner shall be named as an additional insured on the Contractor's commercial general liability and automobile liability policies and shall contain, or be endorsed to contain, that the Owner, it's officers, officials, employees and volunteers, are to be covered as insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Contractor, and with respect to liability arising out of work or operations performed by or on behalf of the Contractor including material, parts or equipment furnished in connection with such work or operations. The Owner shall be endorsed as a loss payee on the Contractor's builders' risk and boiler and machinery policies.

F. **Primary and Non-contributory**. It is the intent of the Contract for the Contractor's insurance to be considered primary in the event of a loss, damage or suit. The Owner's own comprehensive general liability policy will be considered excess coverage in respect to the Owner, its officers, officials, employees, and volunteers, and shall not contribute to the Contractor. Additionally, the Contractor's commercial general liability policy must provide cross-liability coverage as would be achieved under a standard ISO separation of insureds clause.

G. **Notification**. The Contractor shall require from its insurer modification of the ACORD certificates to include language that written notification will be given to the Owner for any cancellation, suspension or material change in the Contractor's coverages at least thirty (30) Days in advance of such cancellation, suspension or material change.

H. **Term of Insurance Coverage**. Contractor shall maintain insurance coverages herein during the Work and for two (2) years after Final Acceptance. Contractor shall also maintain such insurance coverage during the performance of any corrective Work required by Section 5.16.

I. **Subcontractor Coverage**. Contractor shall require and verify all Subcontractors maintain insurance meeting all of the requirements stated herein.

J. **Waiver of Subrogation Rights**. Owner and Contractor waive all subrogation rights against each other, any Subcontractors, A/E, A/E's subconsultants, separate contractors, if any, and any of their subcontractors, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Section or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by Owner as fiduciary. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective 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.

2.02 MINIMUM INSURANCE COVERAGES

A. **General Liability Insurance**. Commercial General Liability (CGL) insurance on a project-occurrence basis, with coverage at least as broad as ISO form CG 00 01 with minimum limits of $2,000,000 per occurrence and $4,000,000 in the aggregate. Coverage shall include, but not be limited to:

1. Premise/operations;
2. Contractual liability;
3. Products & completed operations;
4. Independent contractors
5. Property damage; and
6. Personal injury/advertising injury

B. **Automobile Liability Insurance**. Commercial automobile liability insurance on a Combined Single Limit basis at least as broad as ISO form CA 00 01 with minimum limits of $2,000,000 per occurrence.

C. **Industrial Insurance**. Contractor shall comply with the Washington State Industrial Insurance Act and, if applicable, the Federal Longshoremen's and Harbor Workers' Act and the Jones Act.

D. **Builder's Risk**. Builder's Risk coverage on a replacement-cost basis, at an amount equal to the initial Contract Sum and any subsequent Change Orders, plus twenty-five percent (25%) for additional architectural and engineering services. This property insurance shall cover, at a minimum, malicious mischief, false work, temporary buildings, debris removal including demolition occasioned by enforcement of any applicable legal requirements, reasonable compensation for Owner's and, if applicable, A/E's services and expenses required as a result of an insured loss, perils insured under the ISO special cause of loss form CP 10 30 and shall be endorsed to provide full coverage for loss or damage from collapse, including collapse resulting from design error. The policy shall cover reasonable compensation for architects' and/or engineers' services and expenses made necessary by an insured loss. Insured property shall include portions of the Work located away from the work site, but intended for use at the work site, and shall cover portions of the Work in transit. The policy shall cover the cost of removing debris, including demolition as may be legally necessary by any law, ordinance or regulation.

The builders risk policy shall be maintained in effect, unless otherwise provided for in the Contract Documents, until the earliest of the following dates: (a) the date on which all persons and organizations who are insureds on the policy agree it shall be terminated; (b) the date on which final payment has been made; (c) the date on which the insurable interests in the property of all insureds other than the Owner have ceased.

E. For projects not involving construction of a new building, an "Installation Floater" is an acceptable substitute for Builder's Risk Insurance. The Installation Floater shall cover all interests of the Owner, Contractor and any Subcontractors, as their interests may appear, for the duration of the Project.

F. **Boiler & Machinery**. When applicable, Contractor shall purchase and maintain boiler and machinery coverage covering insured objects during installation and until Final Acceptance by Owner. This insurance shall name as insureds the Owner, Contractor, and all Subcontractors of any tier.

2.03 PAYMENT AND PERFORMANCE BONDS

A. Payment and performance bonds for one hundred percent (100%) of the Contract Award Amount plus state sales tax, shall be furnished for the Work, using the Payment Bond and Performance Bond form published by and available from the American Institute of Architects (AIA) – form A312 (or current version of the same). Prior to execution of a Change Order that, cumulatively with previous Change Orders, increases the Contract Award Amount by fifteen percent (15%) or more, the Contractor shall provide either new payment and performance bonds for the revised Contract Sum, or riders to the existing payment and performance bonds increasing the amount of the bonds. The Contractor shall likewise provide additional bonds or riders when subsequent Change Orders increase the Contract Sum by fifteen percent (15%) or more.

B. No payment or performance bond is required if the Contract Sum is $150,000 (one-hundred fifty thousand dollars) or less and Contractor agrees in writing that Owner may, in lieu of the bond, retain ten percent (10%) of the Contract Sum for the period allowed by RCW 39.08.010.

C. **Alternative Surety**. Contractor shall promptly furnish payment and performance bonds from an alternative surety as required to protect Owner and persons supplying labor or materials required by the Contract Documents if:

1. Owner has a reasonable objection to the surety; or
2. Any surety fails to furnish reports on its financial condition if requested by Owner.

PART 3: TIME AND SCHEDULE

3.01 PROGRESS AND COMPLETION

Contractor shall diligently execute the Work, with adequate forces, achieve Substantial Completion within the Contract Time, and achieve Final Completion within a reasonable period thereafter.

3.02 CONSTRUCTION SCHEDULE

A. **Preliminary Progress Schedule**. Unless otherwise provided in the Contract, Supplemental Conditions, or Modifications to GC, Contractor shall, within fourteen (14) Days after issuance of the Notice to Proceed, submit a preliminary Progress Schedule. The Progress Schedule shall show the sequence in which Contractor proposes to perform the Work, and the dates on which Contractor plans to start and finish major portions of the Work, including dates for shop drawings and other submittals, and for acquiring materials and equipment.

B. **Form of Progress Schedule**. The Progress Schedule shall be created, maintained and edited using MS Project software or similar software identified and agreed to by and between the parties. The scheduling of construction is the responsibility of the Contractor and is included in the Contract to assure adequate planning and execution of the Work. The schedule will be used to evaluate progress of the Work for payment based on the Schedule of Values. The schedule shall show the Contractor's planned order and interdependence of activities, and sequence of work. At a minimum, the schedule shall include:

- Date of Notice to Proceed;
- Activities (resources, durations, individual responsible for activity, early starts, late starts, early finishes, late finishes, etc.);
- Utility Shutdowns;
- Interrelationships and dependence of activities;
- Planned vs. actual status for each activity;
- Substantial Completion;
- Punch list;
- Final inspection;
- Final Completion, and
- Float time.

The Schedule Duration shall be based on the Contract Time of Completion listed on the Bid Proposal Form. The Owner shall not be obligated to accept any Early Completion Schedule suggested by the Contractor. The Contract Time for Completion shall establish the Schedule Completion Date.

If the Contractor feels that the Work can be completed in less than the specified Contract

Time, then the surplus time shall be considered Project Float. This Project Float time shall be shown on the Project Schedule. It shall be available to accommodate changes in the Work and unforeseen conditions.

Neither the Contractor nor the Owner have exclusive right to this Float Time. It belongs to the Project.

C. **Owner Comments on Progress Schedule**. Owner shall return comments on the preliminary Progress Schedule to Contractor within fourteen (14) Days of receipt. Review by Owner of Contractor's schedule does not constitute an approval or acceptance of Contractor's construction means, methods or sequencing, or its ability to complete the Work within the Contract Time. Contractor shall revise and resubmit its schedule, as necessary. Owner may withhold a portion of progress payments until a Progress Schedule has been submitted which meets the requirements of this Section.

D. **Monthly Updates and Compliance with Progress Schedule**. Contractor shall utilize and comply with the Progress Schedule. On a monthly basis, or as otherwise directed by Owner, Contractor shall submit an updated Progress Schedule at its own expense to Owner indicating actual progress. If, in the opinion of Owner, Contractor is not in conformance with the Progress Schedule for reasons other than acts of Force Majeure as identified in Section 3.05A, Contractor shall take such steps as are necessary to bring the actual completion dates of its work activities into conformance with the Progress Schedule, and if directed by Owner, Contractor shall submit a corrective action plan or revise the Progress Schedule to reconcile with the actual progress of the Work.

E. **Contractor to Notify Owner of Delays**. Contractor shall promptly notify Owner in writing of any actual or anticipated event which is delaying or could delay achievement of any milestone or performance of any critical path activity of the Work. Contractor shall indicate the expected duration of the delay, the anticipated effect of the delay on the Progress Schedule, and the action being or to be taken to correct the problem. Provision of such notice does not relieve Contractor of its obligation to complete the Work within the Contract Time.

3.03 OWNER'S RIGHT TO SUSPEND THE WORK FOR CONVENIENCE

A. **Owner May Suspend Work**. Owner may, at its sole discretion, order Contractor, in writing, to suspend all or any part of the Work for up to ninety (90) Days, or for such longer period as mutually agreed.

B. **Compliance with Suspension; Owner's Options**. Upon receipt of a written notice suspending the Work, Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of cost of performance directly attributable to such suspension. Within a period up to ninety (90) Days after the notice is delivered to Contractor, or within any extension of that period to which the parties shall have agreed, Owner shall either:

1. Cancel the written notice suspending the Work; or
2. Terminate the Work covered by the notice as provided in the termination provisions of Part 9.

C. **Resumption of Work**. If a written notice suspending the Work is cancelled or the period of the notice or any extension thereof expires, Contractor shall resume Work.

D. **Equitable Adjustment for Suspensions**. Contractor shall be entitled to an equitable adjustment in the Contract Time, or Contract Sum, or both, for increases in the time or cost of performance directly attributable to such suspension, provided Contractor complies with all requirements set forth in Part 7.

3.04 OWNER'S RIGHT TO STOP THE WORK FOR CAUSE

A. **Owner May Stop Work for Contractor's Failure to Perform**. If Contractor fails or refuses to perform its obligations in accordance with the Contract Documents, Owner may order Contractor, in writing, to stop the Work, or any portion thereof, until satisfactory corrective action has been taken.

B. **No Equitable Adjustment for Contractor's Failure to Perform**. Contractor shall not be entitled to an equitable adjustment in the Contract Time or Contract Sum for any increased cost or time of performance attributable to Contractor's failure or refusal to perform or from any reasonable remedial action taken by Owner based upon such failure.

C. **Opportunity to Cure**. Owner, in its sole discretion, may, in the case of termination for breach or default, allow the Contractor an appropriate period of time, as determined by Owner, in which to cure the defect of goods or service. In such case, the notice of termination will state the nature of the breach or default, the time period in which cure is permitted and other appropriate conditions. If the Contractor fails to remedy to Owner's satisfaction the breach or default of any of the terms, covenants or conditions of the Contract Documents within the stated period of time for remedy, Owner shall have the right to terminate the Contract without any further obligation to the Contractor. Any such termination for default shall not in any way operate to preclude Owner from also pursuing all available legal remedies against the Contractor and its sureties for said breach or default.

D. **Waiver of Remedies for Any Breach**. In the event that Owner elects to waive its remedies for any breach by the Contractor of any covenant, term or condition of this Contract, such waiver by Owner shall not limit Owner's legal remedies for any succeeding breach of that or of any other term, covenant, or condition of this contract.

3.05 DELAY

A. **Force Majeure Actions Not A Default; Force Majeure Defined**. Any delay in or failure of performance by Owner or Contractor, other than the payment of money, shall not constitute a default hereunder if and to the extent the cause for such delay or failure of performance was unforeseeable and beyond the control of the party ("Force Majeure"). Acts of Force Majeure include, but are not limited to:

1. Acts of God or the public enemy;
2. Acts or omissions of any government entity;
3. Fire or other casualty for which Contractor is not responsible;
4. Quarantine or epidemic;
5. Strike or defensive lockout;
6. Unusually severe weather, in excess of weather conditions experienced within the area any time in the preceding ten (10) years:
    a. Monthly rainfall in excess of the highest monthly rainfall experienced for the same month.
    b. Annual rainfall in excess of the highest annual rainfall experienced.
    c. Monthly snowfall in excess of the highest monthly snowfall experienced for the same month.
    d. Annual snowfall in excess of the highest annual snowfall experienced.
    e. Average high temperatures, for the summer months, in excess of the highest temperatures experienced.
    f. Average low temperatures for the winter months, lower than the lowest average temperatures experienced.
7. Unusual delay in receipt of supplies or products which were ordered and expedited and for which no substitute reasonably acceptable to Owner was available.

B. **Contract Time Adjustment For Force Majeure**. Contractor shall be entitled to an equitable adjustment in the Contract Time for changes in the time of performance directly attributable to an act of Force Majeure, provided it makes a request for equitable adjustment according to Section 7.03. Contractor shall not be entitled to an adjustment in the Contract Sum resulting from an act of Force Majeure.

C. **Contract Time or Contract Sum Adjustment If Owner at Fault**. Contractor shall be entitled to an equitable adjustment in Contract Time, and may be entitled to an equitable adjustment in Contract Sum, if the cost or time of Contractor's performance is changed due to the fault or negligence of Owner, provided the Contractor makes a request according to Sections 7.02 and 7.03.

D. **No Contract Time or Contract Sum Adjustment If Contractor at Fault**. Contractor shall not be entitled to an adjustment in Contract Time or in the Contract Sum for any delay or failure of performance to the extent such delay or failure was caused by Contractor or anyone for whose acts Contractor is responsible.

E. **Contract Time Adjustment Only for Concurrent Fault**. To the extent any delay or failure of performance was concurrently caused by the Owner and Contractor, Contractor shall be entitled to an adjustment in the Contract Time for that portion of the delay or failure of performance that was concurrently caused, provided it makes a request for equitable adjustment according to

Section 7.03, but shall not be entitled to an adjustment in Contract Sum.

F. **Contractor to Mitigate Delay Impacts**. Contractor shall make all reasonable efforts to prevent and mitigate the effects of any delay, whether occasioned by an act of Force Majeure or otherwise.

3.06 NOTICE TO OWNER OF LABOR DISPUTES

A. **Contractor to Notify Owner of Labor Disputes**. If Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay timely performance in accordance with the Contract Documents, Contractor shall immediately give notice, including all relevant information, to Owner.

B. **Pass Through Notification Provisions to Subcontractors**. Contractor agrees to insert a provision in its Subcontracts and to require insertion in all Subcontractor subcontracts, that in the event timely performance of any such contract is delayed or threatened by delay by any actual or potential labor dispute, the Subcontractor or its subcontractors shall immediately notify the next higher tier Subcontractor or Contractor, as the case may be, of all relevant information concerning the dispute.

3.07 DAMAGES FOR FAILURE TO ACHIEVE TIMELY COMPLETION

A. **Liquidated Damages**

1. **Reason for Liquidated Damages**. Timely performance and completion of the Work is essential to Owner and time limits stated in the Contract Documents are of the essence. Owner will incur serious and substantial damages if Substantial Completion of the Work does not occur within the Contract Time. However, it would be difficult if not impossible to determine the exact amount of such damages. Consequently, provisions for liquidated damages are included in the Contract Documents.

2. **Calculation of Liquidated Damages Amount**. The liquidated damage amounts set forth in the Contract Documents will be assessed not as a penalty, but as liquidated damages for breach of the Contract Documents. This amount is fixed and agreed upon by and between the Contractor and Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain. This amount shall be construed as the actual amount of damages sustained by the Owner and may be retained by the Owner and deducted from periodic payments to the Contractor.

3. **Contractor Responsible Even If Liquidated Damages Assessed**. Assessment of liquidated damages shall not release Contractor from any further obligations or liabilities pursuant to the Contract Documents.

B. **Actual Damages**

1. **Calculation of Actual Damages**. Actual damages will be assessed for failure to achieve Final Completion within the time provided. Actual damages will be calculated on the basis of direct architectural, administrative, and other related costs attributable to the Project from the date when Final Completion should have been achieved, based on the date Substantial Completion is actually achieved, to the date Final Completion is actually achieved. Owner may offset these costs against any payment due Contractor.

PART 4: SPECIFICATIONS, DRAWINGS, AND OTHER DOCUMENTS

4.01 DISCREPANCIES AND CONTRACT DOCUMENT REVIEW

A. **Specifications and Drawings Are Basis of The Work**. The intent of the Specifications and Drawings is to describe a complete Project to be constructed in accordance with the Contract Documents. Contractor shall furnish all labor, materials, equipment, tools, transportation, permits and supplies, and perform the Work required in accordance with the Drawings, Specifications and other provisions of the Contract Documents.

B. **Parts of The Contract Documents Are Complementary**. The Contract Documents are complementary. What is required by one part of the Contract Documents shall be binding as if required by all. Anything mentioned in the Specifications and not shown on the Drawings or shown on the Drawings and not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both.

C. **Contractor to Report Discrepancies in Contract Documents**. Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by Owner. If, during the performance of the Work, Contractor finds a conflict, error, inconsistency or omission in the Contract Documents, it shall promptly, and before proceeding with the Work affected thereby, report such conflict, error, inconsistency or omission to Owner and, if applicable, A/E in writing.

D. **Contractor Knowledge of Discrepancy in Documents – Responsibility**. Contractor shall do no Work without applicable Drawings, Specifications or written modifications, or Shop Drawings where required, unless instructed to do so in writing by Owner. If Contractor performs any construction activity and it knows or reasonably should have known that any of the Contract Documents contain a conflict, error, inconsistency or omission, Contractor shall be responsible for the performance and shall bear the cost for its correction.

E. **Contractor to Perform Work Implied by Contract Documents**. Contractor shall provide any work or materials the provision of which is clearly implied and is within the scope of the Contract Documents even if the Contract Documents do not mention them specifically.

F. **Interpretation Questions Referred to Owner**. Questions regarding interpretation of the requirements of the Contract Documents shall be referred to the Owner and, if applicable, the A/E.

4.02 PROJECT RECORD

A. **Contractor to Maintain Project Record Drawings and Specifications**. Contractor shall legibly mark in ink on a separate set of the Drawings and Specifications all actual construction which differ from the project Drawings and Specifications, including, but not limited to, depths of foundations, horizontal and vertical locations of internal and underground utilities and appurtenances referenced to permanent visible and accessible surface improvements, field changes with dimensions and details, actual suppliers, manufacturers and trade names, models of installed equipment, and Change Order Proposals ("COP"). This separate set of Drawings and Specifications shall be the "Project Record".

B. **Update Project Record Weekly and Keep on Site**. The Project Record shall be maintained on the Project site throughout the construction and shall be clearly labeled "PROJECT RECORD". The Project Record shall be updated at least weekly noting all changes and shall be available to Owner at all times.

C. **Final Project Record to Owner Before Final Acceptance**. Contractor shall submit the completed and finalized Project Record to Owner prior to Final Acceptance.

4.03 SHOP DRAWINGS

A. **Definition of Shop Drawings**. "Shop Drawings" means documents and other information required to be submitted to Owner and by Contractor pursuant to the Contract Documents, showing in detail: the proposed fabrication and assembly of structural elements; and the installation (i.e., form, fit, and attachment details) of materials and equipment. Shop Drawings include, but are not limited to, drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, samples and similar materials furnished by Contractor to explain in detail specific portions of the Work required by the Contract Documents. For materials and equipment to be incorporated into the Work, Contractor submittal shall include the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature and rating of the item. When directed, Contractor shall submit all samples at its own expense. Owner may duplicate, use and disclose Shop Drawings provided in accordance with the Contract Documents.

B. **Approval of Shop Drawings by Contractor and Owner**. Contractor shall coordinate all Shop Drawings and review them for accuracy, completeness and compliance with the Contract Documents, and shall indicate its approval thereon as evidence of such coordination and review. Where required by law, Shop Drawings shall be stamped by an appropriate professional licensed by the state of Washington. Shop Drawings submitted to Owner without evidence of Contractor's approval shall be returned for resubmission. Contractor shall review, approve and submit Shop Drawings with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of Owner or separate contractors. Contractor's submittal schedule shall allow a reasonable time for Owner and, if applicable, A/E review. Owner and, if

applicable, A/E, will review, approve or take other appropriate action on the Shop Drawings. Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings until the respective submittal has been reviewed and the Owner and, if applicable, A/E, has approved or taken other appropriate action. Owner and, if applicable, A/E, shall respond to Shop Drawing submittals with reasonable promptness. Any Work by Contractor shall be in accordance with reviewed Shop Drawings. Submittals made by Contractor which are not required by the Contract Documents may be returned without action.

C. **Contractor Not Relieved of Responsibility When Shop Drawings Approved**. Approval, or other appropriate action with regard to Shop Drawings, by Owner and, if applicable, A/E, shall not relieve Contractor of responsibility for any errors or omissions in such Shop Drawings, nor from responsibility for compliance with the requirements of the Contract Documents. Unless specified in the Contract Documents, review by Owner and, if applicable, A/E, shall not constitute an approval of the safety precautions employed by Contractor during construction, or constitute an approval of Contractor's means or methods of construction. If Contractor fails to obtain approval before installation, and the item or work is subsequently rejected, Contractor shall be responsible for all costs of correction.

D. **Variations Between Shop Drawings and Contract Drawings**. If Shop Drawings show variations from the requirements of the Contract Documents, Contractor shall describe such variations in writing, separate from the Shop Drawings, at the time it submits the Shop Drawings containing such variations. If Owner and, if applicable, A/E, approves any such variation, an appropriate Change Order will be issued. If the variation is minor and does not involve an adjustment in the Contract Sum or Contract Time, a Change Order need not be issued; however, the modification shall be recorded upon the Project Record.

E. **Contractor to Submit Shop Drawings**. Unless otherwise provided in Division 1, Contractor shall submit to Owner and, if applicable, A/E, for approval three (3) original paper copies and an electronic copy in PDF format of all Shop Drawings. Unless otherwise indicated, one (1) original copy of all Shop Drawings shall be retained by Owner; one (1) original copy shall be retained by A/E; and one (1) original copy shall be returned to Contractor.

4.04 ORGANIZATION OF SPECIFICATIONS

A. **Specification Organization by Trade**. Specifications are prepared in sections which conform generally with trade practices. These sections are for Owner and Contractor convenience and shall not control Contractor in dividing the Work among the Subcontractors or in establishing the extent of the Work to be performed by any trade.

4.05 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS, AND OTHER DOCUMENTS

A. **Owner Or, If Applicable, A/E, Not Contractor, Owns Copyright of Drawings and Specifications**. The Drawings, Specifications and other documents prepared by Owner or, if applicable, A/E, (the "Preparer") are instruments of Preparer's service through which the Work to be executed by Contractor is described. Neither Contractor nor any Subcontractor shall own or claim a copyright in the Drawings, Specifications and other documents prepared by Preparer, and Preparer shall be deemed the author of them and will, along with any rights of Owner, retain all common law, statutory and other reserved rights, in addition to the copyright. All copies of these documents, except Contractor's set, shall be returned or suitably accounted for to Owner or, if applicable, A/E, on request, upon completion of the Work.

B. **Drawings and Specifications to Be Used Only for This Project**. The Drawings, Specifications and other documents prepared by the Owner or, if applicable, A/E, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor on other projects or for additions to this Project outside the scope of the Work without the specific written consent of Owner and, if applicable, A/E. Contractor and Subcontractors are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by Owner or, if applicable, A/E, appropriate to and for use in the execution of their Work.

C. **Shop Drawing License Granted to Owner**. Contractor and all Subcontractors grant a non-exclusive license to Owner, without additional

cost or royalty, to use for its own purposes (including reproduction) all Shop Drawings, together with the information and diagrams contained therein, prepared by Contractor or any Subcontractor. In providing Shop Drawings, Contractor and all Subcontractors warrant that they have authority to grant to Owner a license to use the Shop Drawings, and that such license is not in violation of any copyright or other intellectual property right. Contractor agrees to defend and indemnify Owner pursuant to the indemnity provisions in Sections 5.03A and 5.22 from any violations of copyright or other intellectual property rights arising out of Owner's use of the Shop Drawings hereunder, or to secure for Owner, at Contractor's own cost, licenses in conformity with this Section.

D. **Shop Drawings to Be Used Only for This Project**. The Shop Drawings and other submittals prepared by Contractor, Subcontractors of any tier, or its or their equipment or material suppliers, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor of any tier, 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 Owner. The Contractor, Subcontractors of any tier, and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Shop Drawings and other submittals appropriate to and for use in the execution of their Work under the Contract Documents.

PART 5: PERFORMANCE

5.01 CONTRACTOR CONTROL AND SUPERVISION

A. **Contractor Responsible for Means and Methods of Construction**. Contractor shall supervise and direct the Work, using its best skill and attention, and shall perform the Work in a skillful manner. 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, unless the Contract Documents give other specific instructions concerning these matters. Contractor shall disclose its means and methods of construction when requested by Owner.

B. **Competent Superintendence Required**. Performance of the Work shall be directly supervised by a competent superintendent who has authority to act for Contractor. The superintendent must be satisfactory to the Owner and shall not be changed without the prior written consent of Owner. Owner may require Contractor to remove the superintendent from the Work or Project site, if Owner reasonably deems the superintendent incompetent, careless or otherwise objectionable, provided Owner has first notified Contractor in writing and allowed a reasonable period for transition.

C. **Contractor Responsible for Acts and Omissions of Self and Agents**. Contractor shall be responsible to Owner for acts and omissions of Contractor, Subcontractors and their employees and agents.

D. **Contractor to Employ Competent and Disciplined Workforce**. Contractor shall enforce strict discipline and good order among all of the Contractor's employees and other persons performing the Work. Contractor shall not permit employment of persons not skilled in tasks assigned to them. Contractor's employees shall at all times conduct business in a manner which assures fair, equal and nondiscriminatory treatment of all persons. Owner may, by written notice, request Contractor to remove from the Work or Project site any employee Owner reasonably deems incompetent, careless or otherwise objectionable.

E. **Contractor to Keep Project Documents on Site**. Contractor shall keep on the Project site a copy of the Drawings, Specifications, addenda, reviewed Shop Drawings and permits, permit drawings and life safety plans as may be required by federal, state and local agencies.

F. **Contractor to Comply with Ethical Standards**. Contractor shall ensure that its owner(s) and employees, and those of its Subcontractors, comply with the Ethics in Public Service Act, RCW 42.52, which, among other things, prohibits state employees from having an economic interest in any public works contract that was made by, or supervised by, that employee. Contractor shall remove, at its sole cost and expense, any of its, or its Subcontractors' employees if they are in violation of this act.

5.02 PERMITS, FEES, AND NOTICES

A. **Contractor to Obtain and Pay for Permits**. Unless otherwise provided in the Contract Documents, Contractor shall pay for and obtain all permits, licenses and inspections necessary for proper execution and completion of the Work.

Upon issuance of a permit or license, a copy shall be provided to the Owner. Prior to Final Acceptance, the original approved and signed permits shall be delivered to Owner.

B. **Allowances for Permit Fees**. If allowances for permits or utility fees are called for in the Contract Documents and set forth in Contractor's Bid, and the actual costs of those permits or fees differ from the allowances in the Contract Documents, the difference shall be adjusted by Change Order.

C. **Contractor to Comply with All Applicable Laws**. Contractor shall comply with and give notices required by all federal, state and local laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work.

5.03 PATENTS AND ROYALTIES

A. **Payment, Indemnification and Notice**. Contractor is responsible for and shall pay all royalties and license fees. Contractor shall defend, indemnify and hold Owner harmless from any costs, expenses and liabilities arising out of the infringement by Contractor and/or its Subcontractors, of any tier, of any patent, copyright or other intellectual property right used in the Work; however, provided that Contractor gives prompt notice, Contractor shall not be responsible for such defense or indemnity when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents. If Contractor has reason to believe that use of the required design, process or product constitutes an infringement of a patent or copyright, it shall promptly notify Owner of such potential infringement in writing.

5.04 PREVAILING WAGES

A. **Contractor to Pay Prevailing Wages**. Contractor and Subcontractors of any tier shall pay the prevailing rate of wages to all workers, laborers or mechanics employed in the performance of any part of the Work in accordance with RCW 39.12 *Prevailing Wages on Public Works*, the rules and regulations of L&I, and where applicable, the Davis-Bacon and Related Acts. The schedule of prevailing wage rates for the locality or localities of the Work is determined by the Industrial Statistician of L&I. Such schedule is located at: https://secure.lni.wa.gov/wagelookup.
Contractor shall use the Bid Due Date as the effective date and Spokane County as the locality of work when determining applicable prevailing wage rates. A copy of applicable prevailing wage rates is available for viewing upon request at Spokane Transit Authority, 1230 W. Boone Ave., Spokane, WA 99201. It is the Contractor's responsibility to verify the applicable state and federal prevailing wage rates for all job classifications.

B. **Statement of Intent to Pay Prevailing Wage**. Before payment is made by the Owner to the Contractor for any work performed by the Contractor and subcontractors whose work is included in the Application for Payment, the Contractor shall submit, or shall have previously submitted to the Owner for the Project, a Statement of Intent to Pay Prevailing Wages ("Intent"), approved by L&I, certifying the rate of hourly wage to be paid to each classification of laborers, workers or mechanics employed upon the Work by Contractor and Subcontractors of any tier. Such rates of hourly wage shall not be less than the prevailing wage rate.

C. **Affidavit of Wages Paid**. Prior to release of retainage or, where applicable, bond, the Contractor shall submit to the Owner an Affidavit of Wages Paid ("Affidavit"), approved by L&I, for the Contractor and every subcontractor, of any tier, which performed work on the Project.

D. **Statement with Pay Application**. Each Application for Payment submitted by Contractor shall state that prevailing wages have been paid in accordance with the pre-filed and approved Intent.

E. **Post Statements of Intent at Job Site**. Copies of the approved Intent(s) shall be posted on the job site with the address and telephone number of the Industrial Statistician of L&I where a complaint or inquiry concerning prevailing wages may be made.

F. **Contractor to Pay for Statements of Intent and Affidavits**. In compliance with chapter 296-127 WAC, Contractor and Subcontractors of any tier shall pay to L&I the currently established fee(s) for each Intent and/or Affidavit submitted to L&I for certification.

G. **Certified Payrolls**. Consistent with RCW 39.12.120 and WAC 296-127-320, the Contractor and Subcontractors of any tier shall keep accurate payroll records for three (3) years from the date of Final Acceptance of the Project and submit certified payroll records using L&I's online system at least once per month. If L&I's online

system is not used, Contractor and Subcontractors of any tier shall file a copy of its certified payroll records directly with L&I in a format approved by L&I at least once per month. A Contractor's and/or Subcontractor's noncompliance with this Section constitutes a violation of RCW 39.12.050.

H. **Dispute Resolution**. Any dispute regarding prevailing wage rates that cannot be resolved between the parties shall be referred to the Director of L&I and such decision of the Director of L&I shall be final and conclusive and binding on the parties.

I. **Compliance with Federal Funding Requirements.** When the Project is subject to Federal Assistance, Contractor and Subcontractors of any tier shall comply with all requirements of the Davis Bacon and Related Acts. In the event the Project is subject to both State of Washington Prevailing Wages and Davis Bacon and Related Acts, the greater of the two prevailing wage rates shall be paid on a classification-by-classification basis.

5.05 HOURS OF LABOR

A. **Overtime**. Contractor shall comply with all applicable provisions of RCW 49.28, which are incorporated herein by reference. Pursuant to that statute, no laborer, worker or mechanic employed by Contractor, any Subcontractor, or any other person performing or contracting to do the whole or any part of the Work, shall be permitted or required to work more than eight (8) hours in any one (1) calendar day, provided, that in cases of extraordinary emergency, such as danger to life or property, the hours of work may be extended, but in such cases the rate of pay for time employed in excess of eight (8) hours of each calendar day shall be not less than one and one-half (1-1/2) times the rate allowed for this same amount of time during eight (8) hours of service.

B. **4-10 Agreements**. Notwithstanding the preceding Section, RCW 49.28 permits a contractor or subcontractor in any public works contract subject to those provisions, to enter into an agreement with its employees in which the employees work up to ten (10) hours in a calendar day. No such agreement may provide that the employees work ten (10) hour days for more than four (4) calendar days a week. Any such agreement is subject to approval by the employees. The overtime provisions of RCW 49.28 shall not apply to the hours, up to forty (40) hours per week, worked pursuant to any such agreement.

5.06 NONDISCRIMINATION

A. **Discrimination Prohibited by Applicable Laws**. Discrimination in all phases of employment is prohibited by, among other laws and regulations, Title VI of the Civil Rights Act, Title VII of the Civil Rights Act of 1964, the Vietnam Era Veterans Readjustment Act of 1974, Sections 503 and 504 of the Vocational Rehabilitation Act of 1973, the Equal Employment Act of 1972, the Age Discrimination Act of 1975, Section 202 of the Americans with Disabilities Act of 1990, the Civil Rights Act of 1991, Presidential Executive Order 11246, Executive Order 11375, Executive Order 13672, Federal Transit law at 49 U.S.C. § 5332, the Washington State Law Against Discrimination, RCW 49.60, and Gubernatorial Executive Order 85-09. These laws and regulations establish minimum requirements for affirmative action and fair employment practices which Contractor and Subcontractors must meet.

B. **During performance of the Work**:

1. **Protected Classes**. Contractor shall not discriminate against any employee or applicant for employment because of race, creed, religion, color, national origin, sex, age, marital status, sexual orientation, gender identity, or the presence of any physical, sensory or mental disability, Vietnam era veteran status, or disabled veteran status, nor commit any other unfair practices as defined in RCW 49.60 and prohibited under state and federal law.

2. **Advertisements to State Nondiscrimination**. Contractor shall, in all solicitations or advertisements for employees placed by or for it, state that all qualified applicants will be considered for employment, without regard to race, creed, religion, color, national origin, sex, age, marital status, sexual orientation, gender identity, or the presence of any physical, sensory, or mental disability.

3. **Contractor to Notify Unions and Others of Nondiscrimination**. Contractor shall send to each labor union, employment agency, or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising the labor union, employment agency, or workers' representative of Contractor's obligations according to the Contract

Documents, RCW 49.60, and state and federal prohibitions against discrimination.

4. **Owner and Government Access to Contractor Records**. Contractor shall permit access to its books, records and accounts, and to its premises by Owner, the Equal Employment Opportunity Commission, and the Washington State Human Rights Commission, for the purpose of investigation to ascertain compliance with this Section of the Contract Documents.

5. **Pass Through Provisions to Subcontractors**. Contractor shall include the provisions of this Section in every Subcontract and shall require Subcontractors to include the provisions of this Section in all contracts for the Project.

5.07 SAFETY PRECAUTIONS

A. **Contractor Responsible for Safety**. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work.

B. **Contractor Safety Responsibilities**. In carrying out its responsibilities according to the Contract Documents, Contractor shall protect the lives and health of employees performing the Work and other persons who may be affected by the Work; prevent damage to materials, supplies and equipment whether on site or stored off-site; and prevent damage to other property at the site or adjacent thereto. Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; shall erect and maintain all necessary safeguards for such safety and protection; and shall notify owners of adjacent property and utilities when prosecution of the Work may affect them.

C. **Contractor to Maintain Safety Records**. Contractor shall maintain an accurate record of exposure data on all incidents relating to the Work resulting in death, traumatic injury, occupational disease or damage to property, materials, supplies or equipment. Contractor shall immediately report any such incident to Owner. Owner shall, at all times, have a right of access to all records of exposure.

D. **Contractor to Provide Hazmat Information and Training**. Contractor shall provide all persons working on the Project site with information and training on hazardous chemicals in their work at the time of their initial assignment, and whenever a new hazard is introduced into their work area.

1. **Information**. At a minimum, Contractor shall inform persons working on the Project site of:

   a. **WAC Requirements**. The requirements of chapter 296-62 WAC, General Occupational Health Standards;

   b. **Presence of Hazardous Chemicals**. Any operations in their work area where hazardous chemicals are present; and

   c. **Hazard Communications Program**. The location and availability of written hazard communication programs, including the required list(s) of hazardous chemicals and material safety data sheets required by chapter 296-62 WAC.

2. **Training**. At a minimum, Contractor shall provide training for persons working on the Project site which includes, but is not limited to:

   a. **Detecting Hazardous Chemicals**. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

   b. **Hazards of Chemicals**. The physical and health hazards of the chemicals in the work area;

   c. **Protection from Hazards**. The measures such persons can take to protect themselves from these hazards, including specific procedures Contractor, its Subcontractors or others have implemented to protect those on the Project site from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures and personal protective equipment to be used; and

d. **Hazard Communications Program**. The details of the hazard communications program developed by Contractor, or its Subcontractors, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

E. **Hazardous, Toxic or Harmful Substances**. Contractor's responsibility for hazardous, toxic or harmful substances shall include the following duties:

1. **Illegal Use of Dangerous Substances**. Contractor shall not keep, use, dispose, transport, generate or sell on or about the Project site, any substances now or hereafter designated as, or which are subject to regulation as, hazardous, toxic, dangerous or harmful by any federal, state or local law, regulation, statute or ordinance (hereinafter collectively referred to as "hazardous substances") in violation of any such law, regulation, statute or ordinance, but in no case shall any such hazardous substance be stored more than ninety (90) Days on the Project site.

2. **Contractor Notifications of Spills, Failures, Inspections, Citations and Fines**. Contractor shall promptly notify Owner of all spills or releases of any hazardous substances which are otherwise required to be reported to any regulatory agency and pay the cost of cleanup. Contractor shall promptly notify Owner of all failures to comply with any federal, state or local law, regulation or ordinance; all inspections of the Project site by any regulatory entity concerning the same; any citation; all regulatory orders or fines; and all responses or interim cleanup actions taken by or proposed to be taken by any government entity or private party on the Project site.

F. **Public Safety and Traffic**. All Work shall be performed with due regard for the safety of the public. Contractor shall perform the Work so as to cause a minimum of interruption of vehicular traffic or inconvenience to pedestrians. All arrangements to care for such traffic shall be Contractor's responsibility. All expenses involved in the maintenance of traffic by way of detours shall be borne by Contractor.

G. **Contractor to Act in an Emergency**. In an emergency affecting the safety of life or the Work or of adjoining property, Contractor is permitted to act, at its discretion, to prevent such threatened loss or injury, and Contractor shall so act if so authorized or instructed.

H. **No Duty of Safety by Owner or A/E**. Nothing provided in this Section shall be construed as imposing any duty upon Owner and, if applicable, A/E, with regard to, or as constituting any express or implied assumption of control or responsibility over, Project site safety, or over any other safety conditions relating to employees or agents of Contractor or any of its Subcontractors, or the public.

5.08 OPERATIONS, MATERIAL HANDLING, AND STORAGE AREAS

A. **Limited Storage Areas**. Contractor shall confine all operations, including storage of materials, to Owner-approved areas.

B. **Temporary Buildings and Utilities at Contractor Expense**. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be provided by Contractor only with the consent of Owner and without expense to Owner. The temporary buildings and utilities shall be removed by Contractor at its expense upon completion of the Work.

C. **Roads and Vehicle Loads**. Contractor shall use only established roadways or temporary roadways authorized by Owner. When materials are transported in prosecuting the Work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by federal, state or local law or regulation.

D. **Ownership and Reporting by Contractor of Demolished Materials**. Ownership and control of all materials or facility components to be demolished or removed from the Project site by Contractor shall immediately vest in Contractor upon severance of the component from the facility or severance of the material from the Project site. Contractor shall be responsible for compliance with all laws governing the storage and ultimate disposal. Contractor shall provide Owner with a copy of all manifests and receipts evidencing proper disposal when required by Owner or applicable law.

E. **Contractor Responsible for Care of Materials and Equipment On-Site**. Contractor shall be responsible for the proper care and protection of its materials and equipment delivered to the Project site. Materials and equipment may be stored on the premises subject to approval of Owner. When Contractor uses any portion of the Project site as a shop, Contractor shall be responsible for any repairs, patching or cleaning arising from such use.

F. **Contractor Responsible for Loss of Materials and Equipment**. Contractor shall protect and be responsible for any damage or loss to the Work, or to the materials or equipment until the date of Substantial Completion, and shall repair or replace without cost to Owner any damage or loss that may occur, except damages or loss caused by the acts or omissions of Owner. Contractor shall also protect and be responsible for any damage or loss to the Work, or to the materials or equipment, after the date of Substantial Completion, and shall repair or replace without cost to Owner any such damage or loss that might occur, to the extent such damages or loss are caused by the acts or omissions of Contractor, or any Subcontractor.

5.09 PRIOR NOTICE OF EXCAVATION

A. **Excavation Defined**. "Excavation" means an operation in which earth, rock, or other material on or below the ground is moved or otherwise displaced by any means, except the tilling of soil less than twelve (12) inches in depth for agricultural purposes, or road ditch maintenance that does not change the original road grade or ditch flow line.

B. **Use of Locator Services**. Before commencing any excavation, Contractor shall provide notice of the scheduled commencement of excavation to all owners of underground facilities or utilities, through locator services.

5.10 UNFORESEEN PHYSICAL CONDITIONS

A. **Notice Requirement for Concealed or Unknown Conditions**. If Contractor encounters conditions at the site which are subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature which 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, then Contractor shall give written notice to Owner promptly and in no event later than seven (7) Days after the first observance of the conditions. Conditions shall not be disturbed prior to such notice.

B. **Adjustment in Contract Time and Contract Sum**. If such conditions differ materially and cause a change in Contractor's cost of, or time required for, performance of any part of the Work, the Contractor may be entitled to an equitable adjustment in the Contract Time or Contract Sum, or both, provided it makes a request therefore as provided in Part 7.

5.11 PROTECTION OF EXISTING STRUCTURES, EQUIPMENT, VEGETATION, UTILITIES, AND IMPROVEMENTS

A. **Contractor to Protect and Repair Property**. Contractor shall protect from damage all existing structures, equipment, improvements, utilities and vegetation at or near the Project site; and on adjacent property of a third party, the locations of which are made known to or should be known by Contractor. Contractor shall repair any damage, including that to the property of a third party, resulting from failure to comply with the requirements of the Contract Documents or failure to exercise reasonable care in performing the Work. If Contractor fails or refuses to repair the damage promptly, Owner may have the necessary work performed and charge the cost to Contractor.

B. **Tree and Vegetation Protection**. Contractor shall only remove trees when specifically authorized to do so and shall protect vegetation that will remain in place.

5.12 LAYOUT OF WORK

A. **Advanced Planning of The Work**. Contractor shall plan and lay out the Work in advance of operations so as to coordinate all work without delay or revision.

B. **Layout Responsibilities**. Contractor shall lay out the Work from Owner-established baselines and benchmarks indicated on the Drawings and shall be responsible for all field measurements in connection with the layout. Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials and labor required to lay out any part of the Work. Contractor shall be responsible for executing the Work to the lines and grades that may be

established. Contractor shall be responsible for maintaining or restoring all stakes and other marks established.

5.13 MATERIAL AND EQUIPMENT

A. **Contractor to Provide New and Equivalent Equipment and Materials**. All equipment, material and articles incorporated into the Work shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in the Contract Documents. References in the Specifications to equipment, material, articles or patented processes by trade name, make or catalog number, shall be regarded as establishing a standard quality and shall not be construed as limiting competition. Contractor may, at its option, use any equipment, material, article or process that, in the judgment of A/E, is equal to that named in the specifications, unless otherwise specifically provided in the Contract Documents.

B. **Contractor Responsible for Fitting Parts Together**. Contractor shall do all cutting, fitting or patching that may be required to make its several parts fit together properly or receive or be received by work of others set forth in, or reasonably implied by, the Contract Documents. Contractor shall not endanger any work by cutting, excavating or otherwise altering the Work and shall not cut or alter the work of any other contractor unless approved in advance by Owner.

C. **Owner May Reject Defective Work**. Should any of the Work be found defective, or in any way not in accordance with the Contract Documents, the Work, in whatever stage of completion, may be rejected by Owner.

5.14 AVAILABILITY AND USE OF PREMISES AND UTILITY SERVICES

A. **Use of Premises**. Contractor's use of Owner's premises is limited to Project activities within the areas identified.

B. **Owner's Occupation of Site**. The Owner may occupy the site and existing building(s) during the entire work period. Contractor agrees to cooperate with Owner during operation to minimize conflicts and facilitate Owner usage. Contractor agrees to perform the work so as not to interfere with the Owner's operations.

C. **Contractor Must Allow Owner Access**. Contractor must at all times provide for and allow Owner access. Contractor shall not store or stage vehicles or materials on driveways or at entrances and must keep these access points serving the premises clear and available to the Owner at all times.

D. **Owner to Provide and Charge for Utilities**. Owner shall make all reasonable utilities available to Contractor from existing outlets and supplies, as specified in the Contract Documents. Unless otherwise provided in the Contract Documents, the utility service consumed shall be charged to or paid for by Contractor at prevailing rates charged to Owner or, where the utility is produced by Owner, at reasonable rates determined by Owner. Contractor will carefully conserve any utilities furnished.

E. **Contractor to Install Temporary Connections and Meters**. Contractor shall, at its expense and in a skillful manner satisfactory to Owner, install and maintain all necessary temporary connections and distribution lines, together with appropriate protective devices, and all meters required to measure the amount of each utility used for the purpose of determining charges. Prior to the date of Final Acceptance, Contractor shall remove all temporary connections, distribution lines, meters and associated equipment and materials.

5.15 TESTS AND INSPECTION

A. **Owner to Provide for All Testing and Inspection of Work**. Owner shall maintain an adequate testing and inspection program and perform such tests and inspections as are necessary or required to ensure that the Work conforms to the requirements of the Contract Documents. Contractor shall be responsible for quality surveillance of all its Work and all Work performed by any Subcontractor. Unless otherwise provided, Owner shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. Contractor shall give Owner timely notice of when and where tests and inspections are to be made. Contractor shall maintain complete inspection records and make them available to Owner.

B. **Owner May Conduct Tests and Inspections**. Owner may, at any reasonable time, conduct such inspections and tests as it deems necessary to ensure that the Work is in accordance with the Contract Documents. Owner shall promptly notify Contractor if an inspection or test reveals

that the Work is not in accordance with the Contract Documents. Unless the subject items are expressly accepted by Owner, such Owner inspection and tests are for the sole benefit of Owner and do not:

1. Constitute or imply acceptance;
2. Relieve Contractor of responsibility for providing adequate quality control measures;
3. Relieve Contractor of responsibility for risk of loss or damage to the Work, materials or equipment;
4. Relieve Contractor of its responsibility to comply with the requirements of the Contract Documents; or
5. Impair Owner's right to reject defective or nonconforming items, or to avail itself of any other remedy to which it may be entitled.

C. **Inspections or Inspectors Do Not Modify Contract Documents**. Neither observations by an inspector retained by Owner, the presence or absence of such inspector on the site, nor inspections, tests or approvals by others, shall relieve Contractor from any requirement of the Contract Documents, nor is any such inspector authorized to change any term or condition of the Contract Documents.

D. **Contractor Responsibilities on Inspections**. Contractor shall promptly furnish, without additional charge, all facilities, labor, material and equipment reasonably needed for performing such safe and convenient inspections and tests as may be required by Owner. Owner may charge Contractor any additional cost of inspection or testing when Work is not ready at the time specified by Contractor for inspection or testing, or when prior rejection makes reinspection or retest necessary. Owner shall perform its inspections and tests in a manner that will cause no undue delay in the Work.

5.16 CORRECTION OF NONCONFORMING WORK

A. **Work Covered by Contractor Without Inspection**. If a portion of the Work is covered contrary to the requirements in the Contract Documents, it must, if required in writing by Owner, be uncovered for Owner's observation and be replaced at the Contractor's expense and without change in the Contract Time.

B. **Payment Provisions for Uncovering Covered Work**. If, at any time prior to Final Completion, Owner desires to examine the Work, or any portion of it, which has been covered, Owner may request to see such Work and it shall be uncovered by Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an adjustment in the Contract Sum for the costs of uncovering and replacement, and, if completion of the Work is thereby delayed, an adjustment in the Contract Time, provided it makes such a request as provided in Part 7. If such Work is not in accordance with the Contract Documents, the Contractor shall pay the costs of examination and reconstruction.

C. **Contractor to Correct and Pay for Non-Conforming Work**. Contractor shall promptly correct Work found by Owner not to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. Contractor shall bear all costs of correcting such nonconforming Work, including additional testing and inspections.

D. **Contractor's Compliance with Warranty Provisions**. If, within one (1) year after the date of Substantial Completion of the Work or designated portion thereof, or within one (1) year after the date for commencement of any system warranties established under Sections 5.16D, 5.21, 6.08B, or within the terms of any 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, Contractor shall correct it promptly after receipt of written notice from Owner to do so. Owner shall give such notice promptly after discovery of the condition. This period of one (1) year 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 performance of the Work. Contractor's duty to correct with respect to Work repaired or replaced shall run for one (1) year from the date of repair or replacement. Obligations under this Section shall survive Final Acceptance.

E. **Contractor to Remove Non-Conforming Work**. Contractor shall remove from the Project site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by Contractor nor accepted by Owner.

F. **Owner May Charge Contractor for Non-Conforming Work**. If Contractor fails to correct nonconforming Work within a reasonable time

after written notice to do so, Owner may replace, correct or remove the nonconforming Work and charge the cost thereof to the Contractor.

G. **Contractor to Pay for Damaged Work During Correction**. Contractor shall bear the cost of correcting destroyed or damaged Work, whether completed or partially completed, caused by Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

H. **No Period of Limitation on Other Requirements**. Nothing contained in this Section shall be construed to establish a period of limitation with respect to other obligations which Contractor might have according to the Contract Documents. Establishment of the time period of one (1) year as described in Section 5.16D relates only to the specific obligation of Contractor to correct the Work, and has no relationship to the time within which the Contractor's obligation to comply with the Contract Documents may be sought to be enforced, including the time within which such proceedings may be commenced.

I. **Owner May Accept Non-Conforming Work and Charge Contractor**. If Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, Owner may do so instead of requiring its removal and correction, in which case the Contract Sum may be reduced as appropriate and equitable.

5.17 CLEAN UP

A. **Contractor to Keep Site Clean and Leave It Clean**. Contractor shall at all times keep the Project site, including hauling routes, infrastructures, utilities and storage areas, free from accumulations of waste materials. Before completing the Work, Contractor shall remove from the premises its rubbish, tools, scaffolding, equipment and materials. Upon completing the Work, Contractor shall leave the Project site in a clean, neat and orderly condition satisfactory to Owner. If Contractor fails to clean up as provided herein, and after reasonable notice from Owner, Owner may do so, and the cost thereof shall be charged to Contractor. Contractor further agrees:

1. To comply with regulations of authorities having jurisdiction and safety standards for cleaning;
2. To not burn waste materials;
3. To not bury debris or excess materials on the Owner's property;
4. To not discharge volatile, harmful or dangerous materials into drainage systems; and
5. To remove waste materials from the site and dispose of in a lawful manner.
6. Where extra materials of value remaining after completion of associated work have become the Owner's property, arrange for disposition of these materials as directed.

5.18 ACCESS TO WORK AND COMMUNICATIONS REGARDING PROJECT STATUS

A. **Owner and A/E Access to Work Site**. Contractor shall provide Owner and, if applicable, A/E, access to the Work in progress wherever located.

B. **Pre-Project Conference**. Owner shall conduct a pre-project conference after execution of the Contract and prior to commencement of Contractor's performance. The parties to the Agreement shall review their respective responsibilities and personnel assignments.

1. **Attendees**. The Owner, the Contractor and its superintendent, subcontractors, suppliers, manufacturers and other concerned parties shall be represented by persons authorized to conclude matters relating to the Work.
2. **Agenda**. Discuss significant items that could affect progress, including the tentative project progress schedule, critical sequencing, use of the premises and procedures for processing Change Orders and equipment deliveries.
3. Minutes of the meeting shall be taken by the Owner. The Owner shall promptly distribute the meeting minutes to everyone concerned. Contractor is required to distribute the meeting minutes to affected subcontractors and prime suppliers.

C. **Progress Meetings at Regular Intervals**. Contractor should attempt to coordinate meeting dates with preparation of payment requests.

1. **Agenda**. Review minutes of the previous progress meeting. Review significant items that could affect progress. Include topics appropriate to the current status of the Project.

2. **Review Project Progress Schedule Since the Last Meeting**. Determine where each activity is in relation to the schedule, and whether on time, ahead of, or behind the schedule. Determine how areas that are behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether revisions are required to ensure that current and subsequent activities will be completed within the Contract time.

D. **Reporting**. No later than three (3) Days after each meeting, distribute copies of minutes of the meeting to each party present and to parties who should have been present. Include a summary, in narrative form, of progress since the previous meeting.

5.19 OTHER CONTRACTS

Owner may undertake or award other contracts for additional work at or near the Project site. Contractor shall reasonably cooperate with the other contractors and with Owner's employees and shall carefully adapt scheduling and perform the Work in accordance with these Contract Documents to reasonably accommodate the other work.

5.20 SUBCONTRACTORS AND SUPPLIERS

A. **Subcontractor Responsibilities**. The Contractor shall include the language of this Section in each of its first-tier Subcontracts and shall require each of its Subcontractors to include the same language of this Section in each of their subcontracts, adjusting only as necessary the terms used for the contracting parties. Upon request of the Owner, the Contractor shall promptly provide documentation to the Owner demonstrating that the Subcontractor meets the subcontractor responsibility criteria below. The requirements of this Section apply to all subcontractors regardless of tier. At the time of subcontract execution, the Contractor shall verify that each of its first-tier subcontracts meet the following bidder responsibility criteria:

1. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW, which must have been in effect at the time of subcontract bid submittal;
2. Have a current Washington Unified Business Identifier (UBI) number;
3. Have a Washington Employment Security Department number, as required in Title 50 RCW;
4. Have a Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
5. Maintain Industrial Insurance (workers' compensation coverage) for the subcontractor's employees working in Washington, as required in Title 51 RCW;
6. Have received training on the requirements related to public works and prevailing wage under this chapter and chapter 39.12 RCW. The training must be provided by L&I or by a training provider whose curriculum is approved by L&I. Contractors that have completed three (3) or more public works projects, have had a valid business license in Washington for three (3) or more years, and are listed on the L&I exemption list are exempt from this training requirement;
7. Within the three (3) year period immediately preceding the date of the bid solicitation, not have been determined by a final and binding citation and notice of assessment issued by L&I, or through a civil judgment entered by a court of limited or general jurisdiction, to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW;
8. Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3); and
9. If applicable, have:
    a. An electrical contractor license, if required by Chapter 19.28 RCW; and/or
    b. An elevator contractor license, if required by Chapter 19.28, RCW.

B. **Provide Names of Subcontractors and Use Qualified Firms**. Before submitting the first Application for Payment, Contractor shall furnish in writing to Owner the names, addresses and telephone numbers of all Subcontractors, as well as suppliers providing materials in excess of $2,500 (two thousand five-hundred dollars). Contractor shall utilize Subcontractors and suppliers which are experienced and qualified, and meet the requirements of the Contract Documents, if any. Contractor shall not utilize any Subcontractor or supplier to whom the Owner has a reasonable objection and shall obtain Owner's written consent before making any substitutions or additions.

C. **Subcontracts in Writing and Pass-Through Provision**. All Subcontracts must be in writing. By appropriate written agreement, Contractor shall require each Subcontractor, so far as applicable to the Work to be performed by the Subcontractor, to be bound to Contractor by terms of the Contract Documents, and to assume toward Contractor all the obligations and responsibilities which Contractor assumes toward Owner in accordance with the Contract Documents. Each Subcontract shall preserve and protect the rights of Owner in accordance with the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. However, nothing in this Section shall be construed to alter the contractual relations between Contractor and its Subcontractors with respect to insurance or bonds.

D. **Coordination of Subcontractors; Contractor Responsible for Work**. Contractor shall schedule, supervise, and coordinate the operations of all Subcontractors. No Subcontracting of any of the Work shall relieve Contractor from its responsibility for the performance of the Work in accordance with the Contract Documents or any other obligations of the Contract Documents.

E. **Automatic Assignment of Subcontracts**. Each subcontract agreement for a portion of the Work is hereby assigned by Contractor to Owner provided that:

1. **Effective Only After Termination and Owner Approval**. The assignment is effective only after termination by Owner for cause pursuant to Section 9.01 and only for those Subcontracts which Owner accepts by notifying the Subcontractor in writing; and
2. **Owner Assumes Contractor's Responsibilities**. After the assignment is effective, Owner will assume all future duties and obligations toward the Subcontractor which Contractor assumed in the Subcontract.
3. **Impact of Bond**. The assignment is subject to the prior rights of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.

5.21 WARRANTY OF CONSTRUCTION

A. **Contractor Warranty of Work**. In addition to any special warranties provided elsewhere in the Contract Documents, Contractor warrants that all Work conforms to the requirements of the Contract Documents and is free of any defect in equipment, material, or design furnished, or workmanship performed by Contractor.

B. **Contractor Responsibilities**. With respect to all warranties, express or implied, for Work performed or materials furnished according to the Contract Documents, Contractor shall:

1. **Obtain Warranties**. Obtain all warranties that would be given in normal commercial practice;
2. **Warranties for Benefit of Owner**. Require all warranties to be executed, in writing, for the benefit of Owner;
3. **Enforcement of Warranties**. Enforce all warranties for the benefit of Owner, if directed by Owner; and
4. **Contractor Responsibility for Subcontractor Warranties**. Be responsible to enforce any subcontractor's, manufacturer's, or supplier's warranties should they extend beyond the period specified in the Contract Documents.

C. **Warranties Beyond Final Acceptance**. The obligations under this Section shall survive Final Acceptance.

5.22 INDEMNIFICATION

A. In performing work and services hereunder, the Contractor, its employees, agents and representatives, shall be acting as independent contractors, and shall not be deemed or construed to be employees or agents of STA in any manner whatsoever. The Contractor shall not hold itself out as, nor claim to be, an officer or employee of STA by reason hereof, and will not make any claim, demand or application to or for any right or privilege applicable to an officer or employee of STA. The Contractor shall be solely responsible for any claims for wages or compensation by the Contractor's employees, agents and representatives, and shall save and hold STA harmless therefrom.

B. To the maximum extent permitted by law, the Contractor shall indemnify and hold harmless STA and all of STA's officers, employees, and agents from and against all claims, demands,

suits, penalties and liability of any kind, including injuries to persons or damages to property, which arise out of or are due to any acts, errors, or omissions of the Contractor, or the Contractor's employees, agents, and representatives in performing work and services under this Agreement. In the event that any claims, investigations, demands, suits, actions, and lawsuits arise out of any of the aforesaid acts, errors, or omissions, the Contractor shall assume all costs of defending such claims, suits, actions, or lawsuits, including legal fees incurred by STA, any penalties imposed on STA or the Contractor, and all judgments that may be obtained against STA, or any of its officers, agents, or employees in such suits. Further, the Contractor waives immunity under the Industrial Insurance Act and assumes all liability for actions brought by him or his employees against STA for injuries in the performance of this Agreement. The Contractor represents this provision has been negotiated with STA.

C. To the maximum extent permitted by law, STA shall indemnify and hold harmless the Contractor and all of Contractor's officers, employees, and agents from and against all claims, demands, suits, penalties and liability of any kind, including injuries to persons or damages to property, which arise out of or are due to any acts, errors, or omissions of STA, or STA's employees, agents, and representatives while engaged in the business of public transportation and with respect to its duties and obligations as fee owner of the real property which Contractor has been engaged to manage. In the event that any claims, investigations, demands, suits, actions, and lawsuits arise out of any of the aforesaid acts, errors, or omissions, STA shall assume all costs of defending such claims, suits, actions, or lawsuits, including legal fees incurred by Contractor, any penalties imposed on Contractor or STA, and all judgments that may be obtained against Contractor, or any of its officers, agents, or employees in such suits. STA represents this provision has been negotiated with Contractor.

PART 6: PAYMENTS AND COMPLETION

6.01 CONTRACT SUM

A. **Owner Shall Pay Contract Sum**. Owner shall pay Contractor the Contract Sum plus state sales tax for performance of the Work, in accordance with the Contract Documents.

6.02 SCHEDULE OF VALUES

A. **Contractor to Submit Schedule of Values**. Before submitting its first Application for Payment, Contractor shall submit to Owner for approval a Schedule of Values. The Schedule of Values shall include appropriate amounts for mobilization and demobilization, record drawings, Operations & Maintenance manuals, and any other requirements for Project closeout, and shall be approved and used by Owner as the basis for progress payments. Project closeout costs should be scheduled independent of any retainage amount. Payment for Work shall be made only for and in accordance with those items included in the Schedule of Values.

6.03 APPLICATION FOR PAYMENT

A. **Statement of Intent to Pay Prevailing Wages**. The Statement of Intent to Pay Prevailing Wages for the Contractor and each Subcontractor must be on file with the Owner before commencement of work and before the first payment can be made.

B. **Monthly Application for Payment with Substantiation**. At monthly intervals, unless determined otherwise by Owner, Contractor shall submit to Owner an itemized Application for Payment for Work completed in accordance with the Contract Documents and the approved Schedule of Values.

1. Each Application for Payment must include a statement that prevailing wages have been paid by the contractor in accordance with the pre-filed statement or statements of Intent to Pay prevailing wages on file.
2. If federally funded, certified weekly payrolls must be submitted with Application for Payment.
3. Each Application for Payment shall be consistent with previous applications and payments as certified and paid for by the Owner.
4. **Payment Application Times**. Progress payments will be made only for actual work performed or materials delivered.
5. **Payment Application Forms**. Use the Form for Applications for Payment included in the addenda or preapproved format.
6. Include amounts of Change Orders and Construction Change Directives issued prior to the last Day of the construction period covered by the application.

7. **Transmittal**. Submit one (1) executed copy of each Application for Payment to the Owner by means ensuring receipt within twenty-four (24) hours; one (1) copy shall be complete, including waivers of lien and similar attachments, when required.

8. Transmit each copy with a transmittal form listing attachment(s), and recording appropriate information related to the application in a manner acceptable to the Owner.

9. **Waivers of Mechanics Lien**. With each Application for Payment, submit waivers of lien from every entity who may lawfully be entitled to file a lien arising out of the Contract, and related to the work covered by the payment.

10. The Contractor shall be paid, upon the submission of proper applications for payment, within thirty (30) Days after STA's approval of the Contractor's application.

C. **Contractor Certifies Subcontractors Paid**. By submitting an Application for Payment, Contractor is certifying that all Subcontractors have been paid, less earned retainage in accordance with RCW 60.28.011, as their interests appeared in the last preceding certificate of payment. By submitting an Application for Payment, Contractor is recertifying that the representations set forth in Section 1.03 are true and correct, to the best of Contractor's knowledge, as of the date of the Application for Payment.

D. **Reconciliation of Work with Progress Schedule**. At the time it submits an Application for Payment, Contractor shall analyze and reconcile, to the satisfaction of Owner, the actual progress of the Work with the Progress Schedule.

E. **Payment for Material Delivered to Site or Stored Off-Site**. If authorized by Owner, the Application for Payment may include request for payment for material delivered to the Project site and suitably stored, or for completed preparatory work. Payment may similarly be requested for material stored off the Project site, provided Contractor complies with or furnishes satisfactory evidence of the following:

1. **Suitable Facility or Location**. The material will be placed in a facility or location that is structurally sound, dry, lighted and suitable for the materials to be stored;

2. **Facility or Location Within 10 Miles of Project**. The facility or location is located within a ten (10) mile radius of the Project. Other locations may be utilized, if approved in writing, by Owner;

3. **Facility or Location Exclusive to Project's Materials**. Only materials for the Project are stored within the facility or location (or a secure portion of a facility or location set aside for the Project);

4. **Insurance Provided on Materials in Facility or Location**. Contractor furnishes Owner a certificate of insurance extending Contractor's insurance coverage for damage, fire, and theft to cover the full value of all materials stored, or in transit;

5. **Facility or Location Locked and Secure**. The facility or location (or secure portion thereof) is continuously under lock and key, and only Contractor's authorized personnel shall have access;

6. **Owner Right of Access to Facility or Location**. Owner shall at all times have the right of access in company of Contractor;

7. **Contractor Assumes Total Responsibility for Stored Materials**. Contractor and its surety assume total responsibility for the stored materials; and

8. **Contractor Provides Documentation and Notice When Materials Moved to Site**. Contractor furnishes to Owner certified lists of materials stored, bills of lading, invoices, and other information as may be required, and shall also furnish Notice to Owner when materials are moved from storage to the Project site.

6.04 PROGRESS PAYMENTS

A. **Owner to Pay Within Thirty (30) Days**. Owner shall make progress payments, in such amounts as Owner determines are properly due, within thirty (30) Days after receipt of a properly executed and complete Application for Payment. Owner shall notify Contractor in accordance with chapter 39.76 RCW if the Application for Payment does not comply with the requirements of the Contract Documents.

B. **Withholding Retainage; Options for Retainage**. When allowed by law, Owner shall retain five percent (5%) of the amount of each progress payment until forty-five (45) Days after Final Acceptance and receipt of all documents

required by law or the Contract Documents, including, at Owner's request, consent of surety to release of the retainage. In accordance with chapter 60.28 RCW, Contractor may request that monies reserved be retained in a fund by Owner, deposited by Owner in a bank or savings and loan, or placed in escrow with a bank or trust company to be converted into bonds and securities to be held in escrow with interest to be paid to Contractor. Owner may permit Contractor to provide an appropriate bond in lieu of the retained funds.

1. When the Project is subject to Federal Assistance, the Owner shall rely upon the Contractor's Payment and Performance Bonds to satisfy (i) The claims of any person or persons arising under the contract to the extent such claims are provided for in RCW 39.08.010; and (ii) the state with respect to taxes, increases, and penalties incurred on the public improvement project under Titles 50, 51, and 82 RCW which may be due. The contract bond must remain in full force and effect until, at a minimum, all claims filed in compliance with chapter 39.08 RCW are resolved.

C. **Title Passes to Owner Upon Payment**. Title to all Work and materials covered by a progress payment shall pass to Owner at the time of such payment free and clear of all liens, claims, security interests, and encumbrances. Passage of title shall not, however, relieve Contractor from any of its duties and responsibilities for the Work or materials, or waive any rights of Owner to insist on full compliance by Contractor with the Contract Documents.

D. **Interest on Unpaid Balances**. Payments due and unpaid in accordance with the Contract Documents may bear interest as specified in Chapter 39.76 RCW.

6.05 PAYMENTS WITHHELD

A. **Owner's Right to Withhold Payment**. Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any payment to such extent as may be necessary to protect Owner from loss or damage for reasons including but not limited to:

1. **Non-Compliant Work**. Work not in accordance with the Contract Documents;

2. **Remaining Work to Cost More Than Unpaid Balance**. Reasonable evidence that the Work required by the Contract Documents cannot be completed for the unpaid balance of the Contract Sum;

3. **Owner Correction or Completion Work**. Work by Owner to correct defective Work or complete the Work in accordance with Section 5.16;

4. **Contractor's Failure to Perform**. Contractor's failure to perform in accordance with the Contract Documents; or

5. **Contractor's Negligent Acts or Omissions**. Cost or liability that may occur to Owner as the result of Contractor's fault or negligent acts or omissions.

B. **Owner to Notify Contractor of Withholding for Unsatisfactory Performance**. In any case where part or all of a payment is going to be withheld for unsatisfactory performance, Owner shall notify Contractor in accordance with Chapter 39.76 RCW.

6.06 RETAINAGE AND BOND CLAIM RIGHTS

A. **Chapters 39.08 RCW and 60.28 RCW Incorporated by Reference**. Chapters 39.08 and 60.28 RCW, concerning the rights and responsibilities of Contractor and Owner with regard to the performance and payment bonds and retainage, are made a part of the Contract Documents by reference as though fully set forth herein.

6.07 SUBSTANTIAL COMPLETION

A. **Substantial Completion Defined**. Substantial Completion is the stage in the progress of the Work (or portion thereof designated and approved by Owner) when the construction is sufficiently complete, in accordance with the Contract Documents, so Owner has full and unrestricted use and benefit of the facilities (or portion thereof designated and approved by Owner) for the use for which it is intended. All Work other than incidental corrective or punch list work shall be completed. Substantial Completion shall not have been achieved if all systems and parts are not functional, if utilities are not connected and operating normally, if all required occupancy permits have not been issued, or if the Work is not accessible by normal vehicular and pedestrian traffic routes. The date Substantial Completion is achieved shall be established in writing by Owner. Contractor may request an early date of

Substantial Completion which must be approved by Change Order. Owner's occupancy of the Work or designated portion thereof does not necessarily indicate that Substantial Completion has been achieved.

6.08 PRIOR OCCUPANCY

A. **Prior Occupancy Defined; Restrictions**. Owner may, upon written notice thereof to Contractor, take possession of or use any completed or partially completed portion of the Work ("Prior Occupancy") at any time prior to Substantial Completion. Unless otherwise agreed in writing, Prior Occupancy shall not: be deemed an acceptance of any portion of the Work; accelerate the time for any payment to Contractor; prejudice any rights of Owner provided by any insurance, bond, guaranty, or the Contract Documents; relieve Contractor of the risk of loss or any of the obligations established by the Contract Documents; establish a date for termination or partial termination of the assessment of liquidated damages; or constitute a waiver of claims.

B. **Damage; Duty to Repair and Warranties**. Notwithstanding anything in the preceding Section, Owner shall be responsible for loss of or damage to the Work resulting from Prior Occupancy. Contractor's one (1) year duty to repair any system warranties shall begin on building systems activated and used by Owner as agreed in writing by Owner and Contractor.

6.09 FINAL INSPECTION, FINAL COMPLETION, ACCEPTANCE, AND PAYMENT (PROJECT CLOSE-OUT)

A. **Final Inspection**. On receipt of a request for inspection, the Owner will either proceed with inspection or advise the Contractor of unfilled requirements. The Owner will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

B. The Owner will repeat the inspection once when requested and assured that the work has been substantially completed. Subsequent inspections necessary to assure that the work has been substantially completed will be charged at the Owner representative's normal billing rate and a Construction Change Directive will be prepared to deduct the representative's charges from the Contract Sum.

1. The Owner will reinspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Owner.
2. Upon completion of reinspection, the Owner will prepare a certificate of Final Acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for Final Acceptance.

C. Before requesting final inspection for certification of Final Acceptance and final payment, Contractor must complete the following:

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes, if applicable, to the Contract Sum.
3. Submit a certified copy of the Owner's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by the Owner.
4. Submit a consent of surety to final payment.
5. Submit a final liquidated damages settlement statement, if applicable.
6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
7. Closeout and final payment of this project may be contingent upon completion and resolution of a Davis-Bacon Prevailing Wage audit.
8. Remove temporary protection and facilities installed for protection of the work during construction.
9. Assurance that unsettled claims will be settled.
10. Assurance that Work not complete and accepted will be completed without undue delay.
11. Transmittal of required project construction records to Owner.

12. Proof that taxes, fees, and similar obligations have been paid.
13. Removal of surplus materials (not belonging to STA), rubbish and similar elements.
14. Affidavit of Wages Paid certification.
15. If federally funded, submit final certified weekly payrolls.
16. All required warranties have been written and submitted.

D. **Final Completion Defined**. Final Completion shall be achieved when the Work is fully complete in accordance with the Contract Documents. The date Final Completion is achieved shall be established by Owner in writing, but in no case shall constitute Final Acceptance which is a subsequent, separate, and distinct action.

E. **Final Acceptance Defined**. Final Acceptance shall be achieved when the Contractor has completed the requirements of the Contract Documents. The date Final Acceptance is achieved shall be established by Owner in writing. Prior to Final Acceptance, Contractor shall, in addition to all other requirements in the Contract Documents, submit to Owner a written notice of any outstanding disputes or claims between Contractor and any of its Subcontractors, including the amounts and other details thereof. Neither Final Acceptance, nor final payment, shall release Contractor or its sureties from any obligations of these Contract Documents or the payment and performance, or constitute a waiver of any claims by Owner arising from Contractor's failure to perform the Work in accordance with the Contract Documents.

1. Final payment (retainage or release of bond where applicable) cannot be made until Release of Lien Notices have been received from the Washington State Department of Revenue, Employment Security Department, and L&I, if applicable.

F. **Final Payment Waives Claim Rights**. Acceptance of final payment by Contractor, or any Subcontractor, shall constitute a waiver and release to Owner of all claims by Contractor, or any such Subcontractor, for an increase in the Contract Sum or the Contract Time, and for every act or omission of Owner relating to or arising out of the Work, except for those Claims made in accordance with the procedures, including the time limits identified in the Contract Documents.

G. **Prior to and/or contemporaneous with, Final Acceptance the following must be complete**:

1. Contractor must submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents;
2. Contractor must obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates, and similar releases as applicable;
3. Contractor must complete final clean up requirements; and
4. Contractor must arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives.

PART 7: CHANGES

7.01 CHANGE IN THE WORK

A. **Changes in Work, Contract Sum, And Contract Time by Change Order**. Owner may, at any time and without notice to Contractor's surety, order additions, deletions, revisions, or other changes in the Work. These changes in the Work shall be incorporated into the Contract Documents through the execution of Change Orders. If any change in the Work ordered by Owner causes an increase or decrease in the Contract Sum or the Contract Time, an equitable adjustment shall be made as provided in Section 7.02 or 7.03, respectively, and such adjustment(s) shall be incorporated into a Change Order.

B. **Owner May Request COP from Contractor**. If Owner desires to order a change in the Work, it may request a written Change Order Proposal (COP) from Contractor. Contractor shall submit a Change Order Proposal within fourteen (14) Days of the request from Owner, or within such other period as mutually agreed. Contractor's Change Order Proposal shall be full compensation for implementing the proposed change in the Work, including any adjustment in the Contract Sum or Contract Time, and including compensation for all delays in connection with such change in the Work and for any expense or

inconvenience, disruption of schedule, or loss of efficiency or productivity occasioned by the change in the Work.

C. **COP Negotiations**. Upon receipt of the Change Order Proposal, or a request for equitable adjustment in the Contract Sum or Contract Time, or both, as provided in Sections 7.02 and 7.03, Owner may accept or reject the proposal, request further documentation, or negotiate acceptable terms with Contractor. Pending agreement on the terms of the Change Order, Owner may direct Contractor to proceed immediately with the Change Order Work. Contractor shall not proceed with any change in the Work until it has obtained Owner's approval. All Work done pursuant to any Owner-directed change in the Work shall be executed in accordance with the Contract Documents.

D. **Change Order as Full Payment and Final Settlement**. If Owner and Contractor reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, such agreement shall be incorporated in a Change Order. The Change Order shall constitute full payment and final settlement of all claims for time and for direct, indirect, and consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity, related to any Work either covered or affected by the Change Order, or related to the events giving rise to the request for equitable adjustment.

E. **Failure to Agree Upon Terms of Change Order; Final Offer and Claims**. If Owner and Contractor are unable to reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, Contractor may at any time in writing, request a final offer from Owner. Owner shall provide Contractor with its written response within thirty (30) Days of Contractor's request. Owner may also provide Contractor with a final offer at any time. If Contractor rejects Owner's final offer, or the parties are otherwise unable to reach agreement, Contractor's only remedy shall be to file a Claim as provided in Part 8.

F. **Field Authorizations**. The Owner may direct the Contractor to proceed with a change in the Work through a written "Field Authorization" (also referred to as a "Field Order") when the time required to price and execute a Change Order would impact the Project.

The Field Authorization shall describe and include the following:

1. The Scope of change to the Work;
2. An estimated amount to perform the scope of the change to the Work;
3. Any estimated change to the Contract Time; and
4. The method of final cost determination in accordance with the requirements of Section 7.02A.3 of the GC; and

Upon satisfactory submittal by the Contractor and approval by the Owner of supporting cost data a Change Order will be executed. The Owner will not make payment to the Contractor for Field Authorization Work until that work has been incorporated into an executed Change Order.

7.02 CHANGE IN THE CONTRACT SUM

A. **General Application**

1. **Contract Sum Changes Only by Change Order**. The Contract Sum shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Sum in its Change Order Proposal.
2. **Owner Fault or Negligence as Basis for Change in Contract Sum**. If the cost of Contractor's performance is changed due to the fault or negligence of Owner, or anyone for whose acts Owner is responsible, Contractor shall be entitled to make a request for an equitable adjustment in the Contract Sum in accordance with the following procedure. No change in the Contract Sum shall be allowed to the extent: Contractor's changed cost of performance is due to the fault or negligence of Contractor, or anyone for whose acts Contractor is responsible; the change is concurrently caused by Contractor and Owner; or the change is caused by an act of Force Majeure as defined in Section 3.05A.
    a. **Notice and Record Keeping for Equitable Adjustment**. A request for an equitable adjustment in the Contract Sum shall be based on written notice delivered to Owner within seven (7) Days of the occurrence of the event giving rise to the request. For purposes of this part, "occurrence" means when Contractor knew, or in its diligent prosecution of the Work should have

known, of the event giving rise to the request. If Contractor believes it is entitled to an adjustment in the Contract Sum, Contractor shall immediately notify Owner and begin to keep and maintain complete, accurate, and specific daily records. Contractor shall give Owner access to any such records and, if requested shall promptly furnish copies of such records to Owner.

b. **Content of Notice for Equitable Adjustment; Failure to Comply**. Contractor shall not be entitled to any adjustment in the Contract Sum for any occurrence of events or costs that occurred more than seven (7) Days before Contractor's written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the Contract Sum; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Sum requested. Failure to properly give such written notice shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.

c. **Contractor to Provide Supplemental Information**. Within thirty (30) Days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with Section 7.02A.2.a above with additional supporting data. Such additional data shall include, at a minimum: the amount of compensation requested, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the damages claimed, but that the damages claimed were actually a result of the act, event, or condition complained of and that the Contract Documents provide entitlement to an equitable adjustment to Contractor for such act, event, or condition; and documentation sufficiently detailed to permit an informed analysis of the request by Owner. When the request for compensation relates to a delay, or other change in Contract Time, Contractor shall demonstrate the impact on the critical path, in accordance with Section 7.03C. Failure to provide such additional information and documentation within the time allowed or within the format required shall, to the extent Owner's interests are-prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.

d. **Contractor to Proceed with Work as Directed**. Pending final resolution of any request made in accordance with this paragraph, unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work.

e. **Contractor to Combine Requests for Same Event Together**. Any requests by Contractor for an equitable adjustment in the Contract Sum and in the Contract Time that arise out of the same event(s) shall be submitted together.

3. **Methods for Calculating Change Order Amount**. The value of any Work covered by a Change Order, or of any request for an equitable adjustment in the Contract Sum, shall be determined by one of the following methods:

a. **Fixed Price**. On the basis of a fixed price as determined in Section 7.02B.

b. **Unit Prices**. By application of unit prices to the quantities of the items involved as determined in Section 7.02C.

c. **Time and Materials**. On the basis of time and material as determined in Section 7.02D.

d. **Fixed Price Method Is Default; Owner May Direct Otherwise**. When Owner has requested Contractor to submit a Change Order Proposal, Owner may direct Contractor as to which method in Section 7.02A.3 to use when submitting its proposal. Otherwise, Contractor shall determine the value of the Work, or of a request for an equitable adjustment, on the basis of the fixed price method.

B. **Change Order Pricing -- Fixed Price**

Procedures. When the fixed price method is used to determine the value of any Work covered by a

Change Order, or of a request for an equitable adjustment in the Contract Sum, the following procedures shall apply:

1. **Breakdown and Itemization of Details on COP**. Contractor's Change Order Proposal, or request for adjustment in the Contract Sum, shall be accompanied by a complete itemization of the costs, including labor, material, subcontractor costs, and overhead and profit. The costs shall be itemized in the manner set forth below and shall be submitted on breakdown sheets in a form approved by Owner.

2. **Use of Industry Standards in Calculating Costs**. All costs shall be calculated based upon appropriate industry standard methods of calculating labor, material quantities, and equipment costs.

3. **Costs Contingent on Owner's Actions**. If any of the Contractor's pricing assumptions are contingent upon anticipated actions of Owner, Contractor shall clearly state them in the proposal or request for an equitable adjustment.

4. **Markups on Additive and Deductive Work**. The cost of any additive or deductive changes in the Work shall be calculated as set forth below, except that overhead and profit shall not be included on deductive changes in the Work. Where a change in the Work involves additive and deductive work by the same Contractor or Subcontractor, small tools, overhead, profit, bond and insurance markups will apply to the net difference.

5. **Breakdown Not Required If Change Less Than $1,000**. If the total cost of the change in the Work or request for equitable adjustment does not exceed $1,000, Contractor shall not be required to submit a breakdown if the description of the change in the Work or request for equitable adjustment is sufficiently definitive for Owner to determine fair value.

6. **Breakdown Required If Change Between $1,000 And $2,500**. If the total cost of the change in the Work or request for equitable adjustment is between $1,000 and $2,500, Contractor may submit a breakdown in the following level of detail if the description of the change in the Work or if the request for equitable adjustment is sufficiently definitive to permit the Owner to determine fair value:

   a. lump sum labor;

   b. lump sum material;

   c. lump sum equipment usage;

   d. overhead in accordance with Section 7.02B.7.f;

   e. profit in accordance with Section 7.02B.7.g; and

   f. insurance and bond costs in accordance with Section 7.02B.7.h.

7. **Components of Increased Cost**. Any request for adjustment of Contract Sum based upon the fixed price method over $2,500 shall include only the following items:

   a. **Craft Labor Costs**. These are the labor costs determined by multiplying the estimated or actual additional number of craft hours needed to perform the change in the Work by the hourly labor costs. Craft hours should cover direct labor, as well as indirect labor due to trade inefficiencies. The hourly costs shall be based on the following:

      (1) **Basic Wages and Benefits**. Hourly rates and benefits as stated on the L&I approved Intent or Davis-Bacon prevailing wages, or a higher amount if approved by the Owner. Direct supervision shall be a reasonable percentage not to exceed fifteen percent (15%) of the cost of direct labor. No supervision markup shall be allowed for a working supervisor's hours.

      (2) **Worker's Compensation Insurance**. Direct contributions to the state of Washington for industrial insurance; medical aid; and supplemental pension, by the class and rates established by L&I.

      (3) **Federal Insurance**. Direct contributions required by the Federal Insurance Compensation Act; Federal Unemployment Tax Act; and the State Unemployment Compensation Act.

      (4) **Travel Allowance**. Travel allowance and/or subsistence, if applicable, shall be consistent with Owner's policy allowing reimbursement or allotment of

amounts actual, reasonable, and necessary. Owner's full policy regarding Travel is available on request.

(5) **Safety**. Cost incurred due to the Washington Industrial Safety and Health Act, which shall be a reasonable percentage not to exceed two percent (2%) of the sum of the amounts calculated in (1), (2), and (3) above.

b. **Material Costs**. This is an itemization of the quantity and cost of materials needed to perform the change in the Work. Material costs shall be developed first from actual known costs, second from supplier quotations or if these are not available, from standard industry pricing guides. Material costs shall consider all available discounts. Freight costs, express charges, or special delivery charges shall be itemized.

c. **Equipment Costs**. This is an itemization of the type of equipment and the estimated or actual length of time the construction equipment appropriate for the Work is or will be used on the change in the Work. Costs will be allowed for construction equipment only if used solely for the changed Work, or for additional rental costs actually incurred by the Contractor. Equipment charges shall be computed on the basis of actual invoice costs or if owned, from the current edition of one of the following sources:

(1) Associated General Contractors - Washington State Department of Transportation ("AGC WSDOT") Equipment Rental Agreement current edition, on the Contract execution date.

(2) The state of Washington Utilities and Transportation Commission for trucks used on highways.

(3) The National Electrical Contractors Association for equipment used on electrical work.

(4) The Mechanical Contractors Association of America for equipment used on mechanical work.

(5) The EquipmentWatch Rental Rate (Blue Book) shall be used as a basis for establishing rental rates of equipment not listed in the above sources. The maximum rate for standby equipment shall not exceed that shown in the AGC WSDOT Equipment Rental Agreement, current edition on the Contract execution date.

d. **Allowance for Small Tools, Expendables & Consumable Supplies**. Small tools consist of tools which cost $250 or less and are normally furnished by the performing contractor. The maximum rate for small tools shall not exceed the following:

(1) **3% For Contractor**. For Contractor, three percent (3%) of direct labor costs.

(2) **5% For Subcontractors**. For Subcontractors, five percent (5%) of direct labor costs.

Expendables and consumable supplies directly associated with the change in Work must be itemized.

e. **Subcontractor Costs**. This is defined as payments Contractor makes to Subcontractors for changed Work performed by Subcontractors of any tier. The Subcontractors' cost of Work shall be calculated and itemized in the same manner as prescribed herein for Contractor.

f. **Allowance for Overhead**. This is defined as costs of any kind attributable to direct and indirect delay, acceleration, or impact, added to the total cost to Owner of any change in the Contract Sum. If the Contractor is compensated under Section 7.03D, the amount of such compensation shall be reduced by the amount Contractor is otherwise entitled to under this Section. This allowance shall compensate Contractor for all non-craft labor, temporary construction facilities, field engineering, schedule updating, as-built drawings, home office cost, B&O taxes, office engineering, estimating costs, additional overhead because of extended time, and any other cost incidental to the change in the Work. It shall be strictly limited in all

cases to a reasonable amount, mutually acceptable, or if none can be agreed upon to an amount not to exceed the rates below:

(1) **Projects Less Than $3 Million**. For projects where the Contract Award Amount is under $3 million, the following shall apply:

(a) **Contractor Markup on Contractor Work**. For Contractor, for any Work actually performed by Contractor's own forces, shall not exceed sixteen percent (16%) of the first $50,000 of the cost, and four percent (4%) of the remaining cost, if any.

(b) **Subcontractor Markup for Subcontractor Work**. For each Subcontractor (including lower tier subcontractors), for any Work actually performed by its own forces, shall not exceed sixteen percent (16%) of the first $50,000 of the cost, and four percent (4%) of the remaining cost, if any.

(c) **Contractor Markup for Subcontractor Work**. For Contractor, for any work performed by its Subcontractor(s), shall not exceed six percent (6%) of the first $50,000 of the amount due each Subcontractor, and four percent (4%) of the remaining amount if any.

(d) **Subcontractor Markup for Lower Tier Subcontractor Work**. For each Subcontractor, for any Work performed by its Subcontractor(s) of any lower tier, shall not exceed four percent (4%) of the first $50,000 of the amount due the sub-Subcontractor, and two percent (2%) of the remaining amount if any.

(e) **Basis of Cost Applicable for Markup**. The cost to which overhead is to be applied shall be developed in accordance with Sections 7.02B.7.a through 7.02B.7.e.

(2) **Projects More Than $3 Million**. for projects where the Contract Award Amount is equal to or exceeds $3 million, the following shall apply:

(a) **Contractor Markup on Contractor Work**. For Contractor, for any Work actually performed by Contractor's own forces, shall not exceed twelve percent (12%) of the first $50,000 of the cost, and four percent (4%) of the remaining cost, if any.

(b) **Subcontractor Markup for Subcontractor Work**. For each Subcontractor (including lower tier subcontractors), for any Work actually performed by its own forces, shall not exceed twelve percent (12%) of the first $50,000 of the cost, and four percent (4%) of the remaining cost, if any.

(c) **Contractor Markup for Subcontractor Work**. For Contractor, for any Work performed by its Subcontractor(s), shall not exceed four percent (4%) of the first $50,000 of the amount due each Subcontractor, and two percent (2%) of the remaining amount if any.

(d) **Subcontractor Markup for Lower Tier Subcontractor Work**. For each Subcontractor, for any Work performed by its Subcontractor(s) of any lower tier, shall not exceed four percent (4%) of the first $50,000 of the amount due the sub-Subcontractor, and two percent (2%) of the remaining amount if any.

(e) **Basis of Cost Applicable for Markup**. The cost to which overhead is to be applied shall be developed in accordance

with Sections 7.02B.7.a through 7.02B.7.e.

g. **Allowance for Profit**. This allowance for profit is an amount to be added to the cost of any change in contract sum, but not to the cost of change in Contract Time for which contractor has been compensated pursuant to the conditions set forth in Section 7.03. It shall be limited to a reasonable amount, mutually acceptable, or if none can be agreed upon, to an amount not to exceed the rates below:

(1) **Contractor/Subcontractor Markup for Self-Performed Work**. For Contractor or Subcontractor of any tier for work performed by their forces, six percent (6%) of the cost developed in accordance with Sections 7.02B.7.a through 7.02B.7.e.

(2) **Contractor/Subcontractor Markup for Work Performed at Lower Tier**. For Contractor or Subcontractor of any tier for work performed by a subcontractor of a lower tier, shall not exceed four percent (4%) of the subcontract cost developed in accordance with Sections 7.02B.7.a through 7.02B.7.h.

h. **Insurance and Bond Premiums**. Cost of change in insurance or bond premium. This is defined as:

(1) **Contractor's Liability Insurance**. The cost of any changes in Contractor's liability insurance arising directly from execution of the Change Order; and

(2) **Payment and Performance Bond**. The cost of the additional premium for Contractor's bond arising directly from the changed Work.

The cost of any change in insurance or bond premium shall be added after overhead and allowance for profit are calculated in accordance with Sections 7.02B.7.f and 7.02B.7.g.

C. **Change Order Pricing -- Unit Prices**

1. **Content of Owner authorization**. Whenever Owner authorizes Contractor to perform Work on a unit-price basis, Owner's authorization shall clearly state:

a. **Scope**. Scope of work to be performed;

b. **Reimbursement Basis**. Type of reimbursement including pre-agreed rates for material quantities; and

c. **Reimbursement Limit**. Cost limit of reimbursement.

2. **Contractor Responsibilities**. Contractor shall:

a. Cooperate with owner and assist in monitoring the work being performed. As requested by Owner, Contractor shall identify workers assigned to the Change Order Work and areas in which they are working;

b. Leave access as appropriate for quantity measurement; and

c. Not exceed any cost limit(s) without Owner's prior written approval.

3. **Cost Breakdown Consistent with Fixed Price Requirements**. Contractor shall submit costs in accordance with Section 7.02B and satisfy the following requirements:

a. **Unit Prices Must Include Overhead, Profit, Bond and Insurance Premiums**. Unit prices shall include reimbursement for all direct and indirect costs of the Work, including overhead, profit, bond, and insurance costs; and

b. **Owner Verification of Quantities**. Quantities must be supported by field measurement statements approved by Owner.

D. **Change Order Pricing -- Time-and-Material Prices**

1. **Content of Owner Authorization**. Whenever Owner authorizes Contractor to perform Work on a time-and-material basis, Owner's authorization shall clearly state:

a. **Scope**. Scope of Work to be performed;

b. **Reimbursement Basis**. Type of reimbursement including pre-agreed rates, if any, for material quantities or labor; and

c. **Reimbursement Limit**. Cost limit of reimbursement.

2. **Contractor responsibilities**. Contractor shall:

   a. **Identify Workers Assigned**. Cooperate with Owner and assist in monitoring the Work being performed. As requested by Owner, identify workers assigned to the Change Order Work and areas in which they are working;

   b. **Provide Daily Timesheets**. Identify on daily time sheets all labor performed in accordance with this authorization. Submit copies of daily time sheets within two (2) business days for Owner's review;

   c. **Allow Owner to Measure Quantities**. Leave access as appropriate for quantity measurement;

   d. **Perform Work Efficiently**. Perform all Work in accordance with this Section as efficiently as possible; and

   e. **Not Exceed Owner's Cost Limit**. Not exceed any cost limit(s) without Owner's prior written approval.

3. **Cost Breakdown Consistent with Fixed Price Requirements**. Contractor shall submit costs in accordance with Section 7.02B and additional verification supported by:

   a. **Timesheets**. Labor detailed on daily time sheets; and

   b. **Invoices**. Invoices for material.

7.03 CHANGE IN THE CONTRACT TIME

A. **COP Requests for Contract Time**. The Contract Time shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Time in its Change Order Proposal.

B. **Time Extension Permitted If Not Contractor's Fault**. If the time of Contractor's performance is changed due to an act of Force Majeure, or due to the fault or negligence of Owner or anyone for whose acts Owner is responsible, Contractor shall be entitled to make a request for an equitable adjustment in the Contract Time in accordance with the following procedure. No adjustment in the Contract Time shall be allowed to the extent Contractor's changed time of performance is due to the fault or negligence of Contractor, or anyone for whose acts Contractor is responsible.

1. **Notice and Record Keeping for Contract Time Request**. A request for an equitable adjustment in the Contract Time shall be based on written notice delivered within seven (7) Days of the occurrence of the event giving rise to the request. If Contractor believes it is entitled to adjustment of Contract Time, Contractor shall immediately notify Owner and begin to keep and maintain complete, accurate, and specific daily records. Contractor shall give Owner access to any such record and if requested, shall promptly furnish copies of such record to Owner.

2. **Timing and Content of Contractor's Notice**. Contractor shall not be entitled to an adjustment in the Contract Time for any events that occurred more than seven (7) Days before Contractor's written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the Contract Time; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Time requested. Failure to properly give such written notice shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.

3. **Contractor to Provide Supplemental Information**. Within thirty (30) Days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with Section 7.03B.2 with additional supporting data. Such additional data shall include, at a minimum: the amount of delay claimed, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the delay claimed, but that the delay claimed was actually a result of the act, event, or condition complained of, and that the Contract Documents provide entitlement to an equitable adjustment in Contract Time for such act, event, or condition; and supporting documentation sufficiently detailed to permit an informed analysis of the request by Owner. Failure to provide such additional information and documentation within the

time allowed or within the format required shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.

4. **Contractor to Proceed with Work as Directed**. Pending final resolution of any request in accordance with this Section, unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work.

C. **Contractor to Demonstrate Impact on Critical Path of Schedule**. Any change in the Contract Time covered by a Change Order or based on a request for an equitable adjustment in the Contract Time, shall be limited to the change in the critical path of Contractor's schedule attributable to the change of Work or event(s) giving rise to the request for equitable adjustment. Any Change Order Proposal or request for an adjustment in the Contract Time shall demonstrate the impact on the critical path of the schedule. Contractor shall be responsible for showing clearly on the Progress Schedule that the change or event: had a specific impact on the critical path, and except in case of concurrent delay, was the sole cause of such impact; and could not have been avoided by resequencing of the Work or other reasonable alternatives.

D. **Cost of Change in Contract Time**. Contractor may request compensation for the cost of a change in Contract Time in accordance with this Section, 7.03.D, subject to the following conditions:

1. **Must Be Solely Fault of Owner Or A/E**. The change in Contract Time shall solely be caused by the fault or negligence of Owner or A/E;

2. **Procedures**. Contractor shall follow the procedure set forth in Section 7.03B;

3. **Demonstrate Impact on Critical Path**. Contractor shall establish the extent of the change in Contract Time in accordance with Section 7.03C; and

4. **Limitations on Daily Costs**. The daily cost of any change in Contract Time shall be limited to the items below, less the amount of any change in the Contract Sum the Contractor may otherwise be entitled to pursuant to Section 7.02B.7.f for any change in the Work that contributed to this change in Contract Time:

a. **Non-Productive Supervision of Labor**. Cost of nonproductive field supervision or labor extended because of the delay;

b. **Weekly Meetings and Indirect Activities**. Cost of weekly meetings or similar indirect activities extended because of the delay;

c. **Temporary Facilities or Equipment Rental**. Cost of temporary facilities or equipment rental extended because of the delay;

d. **Insurance Premiums**. Cost of insurance extended because of the delay;

e. **Overhead**. General and administrative overhead in an amount to be agreed upon, but not to exceed three percent (3%) of the Contract Award Amount divided by the originally specified Contract Time for each Day of the delay.

PART 8: CLAIMS AND DISPUTE RESOLUTION

8.01 CLAIMS

A. **A Claim is Contractor's Remedy**. If the parties fail to reach agreement on the terms of any Change Order for Owner-directed Work as provided in Section 7.01, on the resolution of any request for an equitable adjustment in the Contract Sum as provided in Section 7.02, the Contract Time as provided in Section 7.03, or any dispute interpretation of the parties respective obligations and duties under the Contract documents Contractor's only remedy shall be to file a Claim with Owner as provided in this Section.

B. **Claim Filing Deadline for Contractor.** Contractor shall file its Claim within one-hundred-twenty (120) Days from Owner's final offer made in accordance with Section 7.01E or by the date of Final Acceptance, whichever occurs first.

C. **Claim Must Cover All Costs and Be Documented**. The Claim shall be deemed to cover all changes in cost and time (including direct, indirect, impact, and consequential) to which Contractor may be entitled. It shall be fully substantiated and documented. At a minimum, the Claim shall contain the following information:

1. **Factual Statement of Claim**. A detailed factual statement of the Claim for additional

compensation and time, if any, providing all necessary dates, locations, and items of Work affected by the Claim;

2. **Dates**. The date on which facts arose that gave rise to the claim;

3. **Owner and A/E Employee's Knowledgeable About Claim**. The name of each employee of Owner or A/E knowledgeable about the Claim;

4. **Support from Contract Documents**. The specific provisions of the Contract Documents which support the Claim;

5. **Identification of Other Supporting Information**. The identification of any documents and the substance of any oral communications that support the Claim;

6. **Copies of Supporting Documentation**. Copies of any identified documents, other than the Contract Documents, which support the Claim;

7. **Details on Claim for Contract Time**. If an adjustment in the Contract Time is sought: the specific days and dates for which it is sought; the specific reasons Contractor believes an extension in the Contract Time should be granted; and Contractor's analysis of its Progress Schedule to demonstrate the reason for the extension in Contract Time;

8. **Details on Claim**. for adjustment of Contract Sum: If an adjustment in the Contract Sum is sought, the exact amount sought and a breakdown of that amount into the categories set forth in, and in the detail as required by Section 7.02; and

9. **Statement Certifying Claim**. A statement certifying, under penalty of perjury, that the Claim is made in good faith, that the supporting cost and pricing data are true and accurate to the best of Contractor's knowledge and belief, that the Claim is fully supported by the accompanying data, and that the amount requested accurately reflects the adjustment in the Contract Sum or Contract Time for which Contractor believes Owner is liable.

D. **Response to Claim Filed**. After Contractor has submitted a fully documented Claim that complies with all applicable provisions of Parts 7 and 8, Owner's Contract Compliance Specialist ("CCS"), or their designee, shall respond, in writing, to Contractor as follows:

1. **Response Time for Claim Less Than $50,000**. If the Claim amount is less than $50,000, with a decision within sixty (60) Days from the date the Claim is received; or

2. **Response Time for Claim Of $50,000 Or More**. If the Claim amount is $50,000 or more, with a decision within sixty (60) Days from the date the Claim is received, or with notice to Contractor of the date by which it will render its decision. Owner will then respond with a written decision in such additional time.

E. **Review of Claim and Finality of Decision**. To assist in the review of Contractor's Claim, Owner's CCS, or their designee, may visit the Project site, or request additional information, in order to fully evaluate the issues raised by the Claim. Contractor shall proceed with performance of the Work pending final resolution of any Claim. Owner's CCS' written decision as set forth above shall be final and conclusive as to all matters set forth in the Claim, unless Contractor follows the procedure set forth in Section 8.02.

F. **Waiver of Contractor Rights for Failure to Comply with This Section**. Any Claim of the Contractor against the Owner for damages, additional compensation, or additional time, shall be conclusively deemed to have been waived by the Contractor unless made in accordance with the requirements of this Section.

G. **Finality of Decision**. The CCS' decision shall be final and conclusive unless within ten (10) Days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the Chief Executive Officer ("CEO") of STA. STA's CEO review of the Contracting Officer's decision is limited to a review and decision issued on the same record presented to the Contracting Officer.

H. **Appeal Procedure**. In connection with appeal to CEO, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of this Contract while matters in dispute are being resolved. The final decision of the CEO shall be binding upon the Contractor and the Contractor shall abide by the decision. The only available review is by an arbitrator as provided below and the applicable standard of review is whether the CEO's decision was arbitrary and capricious.

8.02 ARBITRATION

A. **Timing of Contractor's Demand for Review of CEO's Decision by Third-Party Neutral (Arbitration)**. If Contractor disagrees with CEO's decision rendered in accordance with Section 8.01H, Contractor shall provide Owner with a written demand for review by a third-party neutral (arbitration). No demand for arbitration of any such Claim shall be made later than thirty (30) Days after the date of the CEO's decision on such Claim. Failure to demand arbitration within said thirty (30) Day period shall result in the CEO's decision being final and binding upon Contractor and its Subcontractors.

B. **Selection of The Third-Party Neutral (Arbitrator)**. The parties shall mutually select a third-party neutral to review the parties' claims within the confines of the decision issued by the CEO. If the parties are unable to mutually select a third-party neutral, they shall each appoint a neutral and the two appointed neutrals shall agree to the appointment of the third-party neutral who will preside over the matter.

C. **Standard of Review**. The arbitrator's review shall be limited to determining whether the CEO acted arbitrarily and capriciously in issuing its decision. Decisions issued under the Administrative Procedures Act may guide the arbitrator in determining whether the CEO acted arbitrarily and capriciously.

D. **Costs of Arbitration**. The costs of arbitration will be borne by the party against whom judgment is issued. To the extent neither party substantially prevails at arbitration, the parties will split equally the costs associated with the arbitration.

E. **Arbitration is Forum for Resolving Claims Other Than Those Identified Under Part 8 Above**. All Claims arising out of the Work shall be resolved by arbitration. The judgment upon the arbitration award may be entered, or review of the award may occur, in the superior court having jurisdiction thereof. No independent legal action relating to or arising from the Work shall be maintained.

F. **Owner May Combine Claims into Same Arbitration**. Claims between Owner and Contractor, Contractor and its Subcontractors, Contractor and A/E, and Owner and A/E shall, upon demand by Owner, be submitted in the same arbitration or mediation.

G. **Settlement Outside of Arbitration to Be Documented in Change Order**. If the parties resolve the Claim prior to arbitration judgment, the terms of the resolution shall be incorporated in a Change Order. The Change Order shall constitute full payment and final settlement of the Claim, including all claims for time and for direct, indirect, or consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity.

8.03 CLAIMS AUDITS

A. **Owner May Audit Claims**. All Claims filed against Owner shall be subject to audit at any time following the filing of the Claim. Failure of Contractor, or Subcontractors of any tier, to maintain and retain sufficient records to allow Owner to verify all or a portion of the Claim or to permit Owner access to the books and records of Contractor, or Subcontractors of any tier, shall constitute a waiver of the Claim and shall bar any recovery.

B. **Contractor to Make Documents Available**. In support of Owner audit of any Claim, Contractor shall, upon request, promptly make available to Owner the following documents:

1. Daily time sheets and supervisor's daily reports;
2. Collective bargaining agreements;
3. Insurance, welfare, and benefits records;
4. Payroll registers;
5. Earnings records;
6. Payroll tax forms;
7. Material invoices, requisitions, and delivery confirmations;
8. Material cost distribution worksheet;
9. Equipment records (list of company equipment, rates, etc.);
10. Vendors', rental agencies', Subcontractors', and agents' invoices;
11. Contracts between Contractor and each of its Subcontractors, and all lower-tier Subcontractor contracts and supplier contracts;
12. Subcontractors' and agents' payment certificates;
13. Cancelled checks (payroll and vendors);

14. Job cost report, including monthly totals;
15. Job payroll ledger;
16. Planned resource loading schedules and summaries;
17. General ledger;
18. Cash disbursements journal;
19. Financial statements for all years reflecting the operations on the Work. In addition, the Owner may require, if it deems it appropriate, additional financial statements for 3 years preceding execution of the Work;
20. Depreciation records on all company equipment whether these records are maintained by the company involved, its accountant, or others;
21. If a source other than depreciation records is used to develop costs for Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents;
22. All nonprivileged documents which relate to each and every Claim together with all documents which support the amount of any adjustment in Contract Sum or Contract Time sought by each Claim;
23. Work sheets or software used to prepare the Claim establishing the cost components for items of the Claim including but not limited to labor, benefits and insurance, materials, equipment, Subcontractors, all documents which establish the time periods, individuals involved, the hours for the individuals, and the rates for the individuals; and
24. Work sheets, software, and all other documents used by Contractor to prepare its Bid.

C. **Contractor to Provide Facilities for Audit and Shall Cooperate**. The audit may be performed by employees of Owner or a representative of Owner. Contractor, and its Subcontractors, shall provide adequate facilities acceptable to Owner, for the audit during normal business hours. Contractor, and all Subcontractors, shall make a good faith effort to cooperate with Owner's auditors.

PART 9: TERMINATION OF THE WORK

9.01 TERMINATION BY OWNER FOR CAUSE

A. **Seven (7) Day Notice to Terminate for Cause**. Owner may, upon seven (7) Days written notice to Contractor and to its surety, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for cause upon the occurrence of any one or more of the following events:

1. **Contractor Fails to Prosecute Work**. Contractor fails to prosecute the Work or any portion thereof with sufficient diligence to ensure Substantial Completion of the Work within the Contract Time;
2. **Contractor Bankrupt**. Contractor is adjudged bankrupt, makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency;
3. **Contractor Fails to Correct Work**. Contractor fails in a material way to replace or correct Work not in conformance with the Contract Documents;
4. **Contractor Fails to Supply Workers or Materials**. Contractor repeatedly fails to supply skilled workers or proper materials or equipment;
5. **Contractor Failure to Pay Subcontractors or Labor**. Contractor repeatedly fails to make prompt payment due to Subcontractors or for labor;
6. **Contractor Violates Laws**. Contractor materially disregards or fails to comply with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction; or
7. **Contractor in Material Breach of Contract.** Contractor is otherwise in material breach of any provision of the Contract Documents.

B. **Owner's Actions Upon Termination**. Upon termination, Owner may at its option:

1. **Take Possession of Project Site**. Take possession of the Project site and take possession of or use all materials, equipment, tools, and construction equipment and machinery thereon owned by Contractor to maintain the orderly progress of, and to finish, the Work;

2. **Accept Assignment of Subcontracts**. Accept assignment of subcontracts pursuant to Section 5.20; and

3. **Finish the Work**. Finish the Work by whatever other reasonable method it deems expedient.

C. **Surety's Role**. Owner's rights and duties upon termination are subject to the prior rights and duties of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.

D. **Contractor's Required Actions**. When Owner terminates the Work in accordance with this Section, Contractor shall take the actions set forth in Section 9.02B and shall not be entitled to receive further payment until the Work is accepted.

E. **Contractor to Pay for Unfinished Work**. If the unpaid balance of the Contract Sum exceeds the cost of finishing the Work, including compensation for A/E's services and expenses made necessary thereby and any other extra costs or damages incurred by Owner in completing the Work, or as a result of Contractor's actions, such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor shall pay the difference to Owner. These obligations for payment shall survive termination.

F. **Contractor and Surety Still Responsible for Work Performed**. Termination of the Work in accordance with this Section shall not relieve Contractor or its surety of any responsibilities for Work performed.

G. **Conversion Of "Termination for Cause" To "Termination for Convenience"**. If Owner terminates Contractor for cause, and it is later determined that none of the circumstances set forth in Section 9.01A exist, then such termination shall be deemed a termination for convenience pursuant to Section 9.02.

9.02 TERMINATION BY OWNER FOR CONVENIENCE

A. **Owner Notice of Termination for Convenience**. Owner may, upon written notice, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for the convenience of Owner.

B. **Contractor Response to Termination Notice**. Unless Owner directs otherwise, after receipt of a written notice of termination for either cause or convenience, Contractor shall promptly:

1. **Cease Work**. Stop performing Work on the date and as specified in the notice of termination;

2. **No Further Orders or Subcontracts**. Place no further orders or subcontracts for materials, equipment, services or facilities, except as may be necessary for completion of such portion of the Work as is not terminated;

3. **Cancel Orders and Subcontracts**. Cancel all orders and subcontracts, upon terms acceptable to Owner, to the extent that they relate to the performance of Work terminated;

4. **Assign Orders and Subcontracts to Owner**. Assign to Owner all of the right, title, and interest of Contractor in all orders and subcontracts;

5. **Take Action to Protect the Work**. Take such action as may be necessary or as directed by Owner to preserve and protect the Work, Project site, and any other property related to this Project in the possession of Contractor in which Owner has an interest; and

6. **Continue Performance Not Terminated**. Continue performance only to the extent not terminated.

7. **Owner's Property**. If the Contractor has any property in its possession belonging to STA, the Contractor will account for the same, and return it to STA or dispose of it in the manner STA directs.

C. **Terms of Adjustment in Contract Sum If Contract Terminated**. If Owner terminates the Work or any portion thereof for convenience, Contractor shall be entitled to make a request for an equitable adjustment for its reasonable direct costs incurred prior to the effective date of the termination, plus a reasonable allowance for overhead and profit on Work performed prior to termination, plus the reasonable administrative costs of the termination, but shall not be entitled to any other costs or damages, whatsoever, provided however, the total sum payable upon termination shall not exceed the Contract Sum reduced by prior payments. Contractor shall be required to make its request in accordance with the provisions of Part 7.

D. **Owner to Determine Whether to Adjust Contract Time**. If Owner terminates the Work or any portion thereof for convenience, the Contract Time shall be adjusted as determined by Owner.

PART 10: MISCELLANEOUS PROVISIONS

10.01 GOVERNING LAW & VENUE

The Contract Documents and the rights of the parties herein shall be governed by the laws of the state of Washington. Venue shall be in the Superior Court of Spokane County, Washington.

10.02 COMPLIANCE WITH LAWS

Each Party to this Agreement shall comply with all applicable federal, state and local laws and regulations.

10.03 SUCCESSORS AND ASSIGNS

Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Neither party shall assign the Work 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 set forth in the Contract Documents.

10.04 MEANING OF WORDS

Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the code of any governmental authority, whether such reference be specific or by implication, shall be to the latest standard specification, manual, or code in effect on the date for submission of bids, except as may be otherwise specifically stated. Wherever in these Drawings and Specifications an article, device, or piece of equipment is referred to in the singular manner, such reference shall apply to as many such articles as are shown on the drawings or required to complete the installation.

10.05 EMPLOYEE SOLICITATION

Contractor, without the written consent of Owner, shall not directly or indirectly solicit, influence, entice or hire or attempt to solicit, influence, entice or hire any employee of Owner to: (a) cease employment with Owner; or (b) do business related to a business connected with the Contractor's business during this Agreement and for a period of three (3) years from the date on which the Agreement terminates, or the Work is accepted by Owner, whichever is earlier. Owner's employees shall be deemed to be related to or connected with a Contractor if such Owner employee becomes (a) a partner in a general or limited partnership or employee of a partnership; or (b) a shareholder, officer, employee or director of a corporation, member, consultant or agent for the Contractor or any of Contractor's affiliates, subsidiaries or connected business. This Section shall survive the termination of the Contract. This Contract is not restricted to any geographical area.

Contractor recognizes and acknowledges that Owner's employees may receive training and other benefits from its contractual relationship with Owner because of Owner's assignment of employees to work in connection with the Contract. Contractor agrees the restrictions on soliciting, influencing, enticing or hiring Owner employees are reasonable.

10.06 RIGHTS AND REMEDIES

No action or failure to act by Owner or A/E shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor shall action or failure to act constitute approval or an acquiescence in a breach therein, except as may be specifically agreed in writing.

10.07 CONTRACTOR REGISTRATION

Pursuant to RCW 39.06, Contractor shall be registered or licensed as required by the laws of the State of Washington, including but not limited to RCW 18.27.

10.08 TIME COMPUTATIONS

When computing any period of time, the day of the event from which the period of time begins shall not be counted. The last day is counted unless it falls on a weekend or legal holiday, in which event the period runs until the end of the next day that is not a weekend or holiday.

10.09 PUBLIC RECORDS ACT

Each Party to the Contract understands and acknowledges the Owner is a municipal corporation of the State of Washington subject to the "Public Records Act", RCW 42.56 *et seq*.

Contractor understands and agrees that the records it obtains or produces under this Agreement may be public records under the Public Records Act, or its successor act. The Contractor shall cooperate in a timely manner with Owner in responding to a public records request ("PRR") related to this Agreement or the goods/services provided under this Agreement. Such cooperation shall include searching all records regarding the Work and producing all records that are potentially responsive to a PRR to Owner. Contractor shall mark and segregate all materials in its possession that may be protected by the Public Records Act to protect against inadvertent disclosure of such documents and to facilitate Owner's application of allowable Public Records Act exemptions. Contractor shall not charge Owner for the time spent gathering and producing records pursuant to a PRR.

10.10 RECORDS RETENTION

The wage, payroll and cost records of Contractor, and its Subcontractors created or used for the Project, shall be retained for a period of not less than six (6) years after the date of Final Acceptance.

10.11 THIRD-PARTY AGREEMENTS

The Contract Documents shall not be construed to create a contractual relationship of any kind between: A/E and Contractor; Owner and any Subcontractor, or any persons other than Owner and Contractor.

10.12 HEADINGS AND CAPTIONS

All headings and captions used in these GC are only for convenience of reference and shall not be used in any way in connection with the meaning, effect, interpretation, construction or enforcement of the GC, and do not define the limit or describe the scope or intent of any provision of these GC.

10.13 ANTITRUST ASSIGNMENT

Owner and Contractor recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the purchaser. Therefore, Contractor hereby assigns to Owner any and all claims for such overcharges as to goods, materials and equipment purchased in connection with the Work performed in accordance with the Contract Documents, except as to overcharges which result from antitrust violations commencing after the Contract Sum is established and which are not passed on to Owner under a Change Order. Contractor shall put a similar clause in its Subcontracts, and require a similar clause in its sub-Subcontracts, such that all claims for such overcharges on the Work are passed to Owner by Contractor.

10.14 CONFLICT OF INTEREST

No employee, officer or agent of Owner shall participate in the selection, award or administration of the Contract if a conflict of interest, real or apparent, would be involved. Such conflict would arise when:

A. The employee, officer or agent;

B. any member of his or her immediate family;

C. his or her partner; or

D. an organization which employs, or is about to employ, an employee, officer or agent of STA

has a financial interest in the firm, Contractor or Subcontractors, of any tier, selected for Award.

10.15 COUNTERPARTS

The Contract may be executed in one or more counterparts, each of which shall constitute an original Contract, but all of which together shall constitute one and the same instrument.

10.16 ELECTRONIC SIGNATURES

A signed copy of this Agreement or any other ancillary agreement transmitted by facsimile, email or other means of electronic transmission shall be deemed to have the same legal effect as delivery of any original executed copy of this Agreement or such other ancillary agreement for all purposes.

END OF SECTION 007200

SECTION 007300 - Supplemental Conditions

1. LIQUIDATED DAMAGES

The Contractor agrees to pay to STA liquidated damages in the amount of $234 for each Day the Contractor fails to provide services or respond to an STA request for services hereinafter provided. These liquidated damages are for the purpose of any delay or impact caused to STA by virtue of the Contractor's acts or omissions and do not cover any other actual or consequential damages other than delay. STA and the Contractor agree that such damages cannot be reasonably determined at this time. Such damages are very difficult to accurately estimate because of numerous factors, including, but not limited to inconvenience to STA. Further, the Parties agree this is a reasonable forecast of all factors now known and available for consideration relating to the delay caused by Contractor's failure to perform. Liquidated damages shall be deducted from the Contract by Change Order.

2. RULE 171 – WAC 458-20-171

This Project qualifies as "public road construction" as described in WAC 458-20-171 ("Rule 171"), and therefore only materials used or consumed by the Contractor are subject to sales tax.

The Contractor shall pay all taxes, including sales tax, for the work or portions thereof provided by the Contractor and such taxes shall be included in the Contract amount.

State of Washington sales tax is payable on the "selling price" or "gross proceeds of sale" of the "tangible personal property" as these terms are defined in WAC 458-20-107 (Rule 107), except as excluded by WAC 458-20-171.

Contractors are advised that they are considered the end consumers of all material, including prefabricated and pre-cast items, equipment and supplies used or consumed by them in performing the Work, and must pay any applicable retail sales tax/use tax to their material men and suppliers. In order to maximize the sales tax exemption, Contractors are encouraged to have all material delivered to the job site for consumption. If the Contractor has questions about the application of Rule 171, the Contractor is advised to contact the Washington State Department of Revenue. However, any such communications must be communicated to STA's Director of Finance, prior to making contact with the Department of Revenue.

The Contract Amount must include labor, overhead, profit and applicable sales tax on material, pursuant to Rule 171. Contractors are cautioned against paying sales tax more than once on materials used or consumed, such as by paying sales tax to material men or suppliers, and again remitting sales tax to the state on total costs.

All applicable taxes which the Contractors are required to pay, including retail sales/use tax as specified above, shall be included by them in the Bid prices for the Work covered by their Bid. No adjustment will be made in the amount to be paid by STA under the Contract because of any misunderstanding by, or lack of knowledge of, the Bidder as to their liability for, or the amount of, any taxes or because of any increases in tax rates imposed by any federal, state or local government.

END OF SECTION 007300

SECTION 007346.1 – WA PREVAILING WAGE RATES – SPOKANE COUNTY

In the preparation of its Bid, based on these specifications, the Bidder is solely responsible to:

1. Use the prevailing wage schedule in effect for the Bid Due Date; and
2. Determine the appropriate labor classification(s); and
3. Utilize the appropriate and correct prevailing wage and benefit rate(s).

The State of Washington, Department of Labor and Industries issues revised wage schedules twice per year (every 6 months) which become effective approximately the first of March and the last of August. The wage schedule that will apply to this solicitation will be the schedule in effect as of the Bid Due Date. Therefore, the Bidder is cautioned to be mindful that Addenda changing the Bid Due Date could make the enclosed schedule obsolete. The Bidder is solely responsible to determine what schedule is applicable to this solicitation and to use that schedule in the preparation of its Bid.

The Prevailing Wage Documents for Public Works from the Washington State Department of Labor and Industries for Spokane County may be found on the Department of Labor and Industries website located at: https://secure.lni.wa.gov/wagelookup. Printed copies of the current prevailing wage schedules and forms are available by contacting STA in accordance with subsection 3 of Section 002100 – Instructions to Bidders.

Questions regarding prevailing wages should be directed to the State of Washington, Department of Labor & Industries, located at 901 N. Monroe St., Suite 100, Spokane, Washington, (509) 324-2600; or to PO Box 44540, Olympia WA 98504-4540; (360) 902-5335.

END OF SECTION 007346.1

SECTION 011000 - SUMMARY

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. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Contractor's use of site and premises.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and Drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
2. Section 017300 "Execution" for coordination of Owner-installed products.

1.3 DEFINITIONS

A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.4 PROJECT INFORMATION

A. Project Identification: STA Whitworth Comfort Station

1. Project Location: northwest of Whitworth Drive and Ivanhoe Road intersection, Spokane, WA. Parcel 36184.2421

B. Project Owner: Spokane Transit Authority, 1230 W. Boone Ave, Spokane, WA.

1. Owner's Representative: Nick Hanson.

C. Property Owner: Whitworth University, 300 W. Hawthorne Road, Spokane, WA.

1. Owner's Representative: Whitworth communication shall be through Nick Hanson.

D. Engineer: Coffman Engineers, 221 N. Wall Street, Suite 500, Spokane, WA 99201.

1. Engineer's Representative: Carston Mortenson, P.E.

E. Architect: ALSC Architects, 203 N Washington St, Suite 400, Spokane, WA 99201.

1. Architect's Representative: Gale Stanley, AIA.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. Demolition of existing shelter and associated curb, sidewalk, and landscape.
2. Construction of new comfort station building including all associated foundations, utilities and furnishings.
3. Installation of new concrete curb, sidewalk, and shelter pad.
4. Connection and extension of water service and sanitary sewer service utilities to the building.
5. Removal and replacement of concrete pavement as indicated on the contract drawings.
6. Various other site work as shown on the contract drawings.

B. Type of Contract:

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

1.6 CONTRACTOR'S USE OF SITE AND PREMISES

A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated by the Contract limits and as indicated by requirements of this Section.

1. Contractor will have use of private drive on project site between Hawthorne Road and Whitworth Drive.
   a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Condition of Existing Pavement and Grounds: Maintain portions of existing pavement, grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

A. Adjacent Owner Occupancy: Owner will occupy adjacent properties and building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing adjacent 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 approval of authorities having jurisdiction.
2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work to normal business working hours of 8:00 a.m. to 4:00 p.m., Monday through Friday, unless otherwise allowed or restricted by Spokane County.

1. Alternative Hours: to be reviewed and approved in advance by Owner.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner and Utility Purveyors not less than ten days in advance of proposed utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to neighboring businesses and traffic operation.

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

E. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages and other controlled substances on Project site is not permitted.

F. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. All other personnel are to have legal identification on them or in close proximity to the work.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

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

1. General coordination procedures.
2. RFIs.

B. Related Requirements:

1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.3 DEFINITIONS

A. RFI: Request for Information. Request from Owner or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. 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, telephone number, and email address 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.

B. 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, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

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 to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

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.

1.6 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Engineer will return without response those RFIs submitted to Engineer by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Owner name.
3. Owner's Project number.
4. Date.
5. Name of Contractor.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.

13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. Engineers Action: Engineer will review each RFI, determine action required, and respond. Allow seven days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

D. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.

1. Project name.
2. Name and address of Contractor.
3. RFI number, including RFIs that were returned without action or withdrawn.
4. RFI description.
5. Date the RFI was submitted.
6. Date response was received.

E. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within 3 days if Contractor disagrees with response.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

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. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
2. Section 017300 “Execution” for progress cleaning requirements.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Engineer, 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, Engineer, occupants of Project, testing agencies, and authorities having jurisdiction.

1.5 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Implementation and Termination Schedule: Within fifteen (15) days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.

C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

D. Sustainable Design Plan: Install temporary erosion and sediment control devices per Erosion and Sediment Control Plan. Contractor personnel responsible for management of erosion and sediment control measures shown on plan.

E. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

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.

1.7 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to 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. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, 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.

B. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain-link fence, sized to height of fence, in color selected by Owner from manufacturer's standard colors.

C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.

D. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches (914 by 1524 mm).

E. 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.

2.2 TEMPORARY FACILITIES

A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Contractor and construction personnel office activities. 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 if needed of sufficient size to accommodate contractor's activities. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.
3. Drinking water and private toilet.
4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
5. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.

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.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 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.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

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.

C. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

1. 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.
2. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

3.3 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. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Use of Permanent Toilets: Use of Owner's existing toilet facilities is not permitted.

3.4 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Provide construction for temporary field offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible in accordance with ASTM E136. 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.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.

1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Traffic Controls: 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.

D. Parking: Use designated off site public parking areas for construction personnel.

E. Storage and Staging: Use designated areas of Project site for storage and staging needs.

F. 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 or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touch up signs, so they are legible at all times.

H. Waste Disposal Facilities: Comply with local codes and ordinances.

I. 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.

3.5 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.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to 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 Section 011000 "Summary."

C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of authorities having jurisdiction and the construction documents, whichever is more stringent.

1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
2. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
3. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection: Install per Whitworth University standards as shown on plans.

F. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

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. 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 roads and paved areas not intended for or acceptable for integration into permanent construction. 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.

END OF SECTION 015000

SECTION 017300 – EXECUTION

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. 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. Construction Phasing.
4. Construction fencing and security.
5. Maintaining owner access to facility.
6. Installation of the Work.
7. Cutting and patching.
8. Progress cleaning.
9. Starting and adjusting.
10. Protection of installed construction.
11. Correction of the Work.

B. Related Requirements:

1. Section 011000 "Summary" for coordination of Owner-furnished products, Owner-performed work, Owner's separate contracts, and limits on use of Project site.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 PREINSTALLATION MEETINGS

A. Cutting and Patching Conference: Conduct conference at Project site.

1. Prior to submitting cutting and patching plan, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and

patching work. Inform Owner of scheduled meeting. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:

a. Contractor's superintendent.
b. Trade supervisor responsible for cutting operations.
c. Trade supervisor(s) responsible for patching of each type of substrate.
d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.

2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

B. Layout Conference: Conduct conference at Project site.

1. Prior to establishing layout, review location requirements. Review benchmark, control point, and layout and dimension requirements. Inform Owners representative of scheduled meeting. Require representatives of each entity directly concerned with Project layout to attend, including the following:

a. Contractor's superintendent.
b. Contractor's qualified professional surveyor responsible for performing Project surveying and layout.
c. Contractor’s qualified professional surveyor responsible for performing site survey serving as basis for Project design.

2. Review meanings and intent of dimensions, notes, terms, graphic symbols, and other layout information indicated on the Drawings.
3. Review requirements for including layouts on Shop Drawings and other submittals.
4. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certified Surveys: Submit an electronic copy signed by land surveyor.

C. Certificates: Submit certificate signed by land surveyor, certifying that location and elevation of improvements comply with requirements.

D. Cutting and Patching Plan: Submit plan describing procedures at least ten (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 length of time permanent services and systems will be disrupted.

    a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

E. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.6 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, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Owner and Engineer of Record of locations and details of cutting and await directions from Owners Representative before proceeding. Shore, brace, and support structural elements 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 the following:

    a. Primary operational systems and equipment.
    b. Fire separation assemblies.
    c. Air or smoke barriers.
    d. Fire-suppression systems.
    e. Plumbing piping systems.
    f. Mechanical systems piping and ducts.
    g. Control systems.
    h. Communication systems.
    i. Fire-detection and -alarm systems.
    j. Electrical wiring systems.
    k. 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. Sprayed fire-resistive material.
d. Equipment supports.
e. Piping, ductwork, vessels, and equipment.

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 Owner Representative's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

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 Owner Representative for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. 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.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

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, gas service piping, 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. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. 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 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, submit a request for information to Owner’s Representative in accordance with requirements in Section 013100 "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 and existing conditions. If discrepancies are discovered, notify Owner's Representative promptly.

B. Engage a land surveyor/professional engineer experienced in laying out the Work, using the following 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 limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Owner's Representative when deviations from required lines and levels exceed allowable tolerances.
7. 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, 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 Owners Representative.

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 Owners Representative. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Owners Representative 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 (2) 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.

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.

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 satisfactory results as judged by Owner Representative. 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 of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. 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 with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Owners Representative.
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.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Owner Representative. Fit exposed connections together to form hairline joints.

3.6 CUTTING AND PATCHING

A. 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. 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.

C. 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 in Section 011000 "Summary."

D. 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.

E. 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.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
5. 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.
6. Proceed with patching after construction operations requiring cutting are complete.

F. 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, as judged by Owner. 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 eliminate 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. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

G. 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 PROGRESS CLEANING

A. 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. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

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: 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 Section 015000 "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 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.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 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. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace damaged, defective, or nonconforming Work. 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. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Restore permanent facilities used during construction to their specified condition.

D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

END OF SECTION 017300

SECTION 024116 - STRUCTURE DEMOLITION

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. Demolition and removal of buildings.
2. Removing below-grade construction.
3. Disconnecting, capping or sealing, and abandoning in-place site utilities.

B. Related Requirements:

1. Section 01 10 00 "Summary" for use of the premises and phasing requirements.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be demolished.
2. Review structural load limitations of existing structures.
3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review and finalize protection requirements.
5. Review procedures for noise control and dust control.
6. Review procedures for protection of adjacent buildings.
7. Review items to be salvaged and returned to Owner.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For refrigerant recovery technician.

B. Engineering Survey: Submit engineering survey of condition of building.

C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.

1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain.

D. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Temporary interruption of utility services.
3. Shutoff and capping or re-routing of utility services.

E. Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by salvage and demolition operations.

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.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before building demolition, Owner will remove the following items:

a. Furnishings, equipment and other.

C. Hazardous Materials: Present in buildings and structures to be 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 material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

D. On-site storage or sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

2.2 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in documents.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

D. Inventory and record the condition of items to be removed and salvaged.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

B. Salvaged Items: Comply with the following:

1. Clean salvaged items of dirt and demolition debris.

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 storage area designated by Owner.
5. Protect items from damage during transport and storage.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.

1. Owner will arrange to shut off utilities when requested by Contractor.
2. Arrange to shut off utilities with utility companies.
3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
4. Cut off pipe or conduit below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
5. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.

a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 01 50 00 "Temporary Facilities and Controls."

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.

3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.5 DEMOLITION, GENERAL

A. General: Demolish indicated buildings completely. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
2. Maintain fire watch during and for at least 4 hours after flame-cutting operations.
3. Maintain adequate ventilation when using cutting torches.
4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Explosives: Use of explosives is not permitted.

3.6 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

C. Below-Grade Construction: Demolish foundation walls and other below-grade construction.

1. Remove below-grade construction, including basements, foundation walls, and footings, completely.

D. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.

E. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

F. Hydraulic Elevator Systems: Demolish and remove elevator system, including cylinder, plunger, well assembly, steel well casing and liner, oil supply lines, and tanks.

3.7 SITE RESTORATION

A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.

3.8 REPAIRS

A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

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. Do not burn demolished materials.

3.10 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

1. Clean roadways of debris caused by debris transport.

END OF SECTION 024116

SECTION 033000 - CAST-IN-PLACE CONCRETE

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 cast-in-place concrete for building slabs, footings, foundations and structural components: including formwork, vapor retarder, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 07 92 00 “Joint Sealants” for sealant joints in concrete.

1.3 DEFINITIONS

A. Architectural Concrete: Formed concrete that is exposed to view on surfaces of completed structure or building and that requires special concrete materials, formwork, placement or finishes to obtain specified architectural appearance.

B. Cast-in-Place Concrete: Formed concrete that is concealed or locations where appearance is not critical.

C. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

D. W/C Ratio: The ratio by weight of water to cementitious materials.

E. Slump: The measurement of the vertical difference in the height of the resulting concrete pile and the original 12 inch tall cone after the slump cone is filled then lifted.

F. Slump Flow: The measurement of the resulting horizontal diameter of the concrete pile after the slump cone is filled then lifted. This method measures the unconfined flow of the mixture.

1.4 ACTION SUBMITTALS

A. Product Data: Submit manufacturer’s printed data and instructions for products and equipment, including the following:

1. Portland Cement

2. Fly ash
3. Slag cement
4. Silica fume
5. Bonding agents
6. Curing materials and methods
7. Joint Fillers
8. Repair Materials
9. Vapor retarders
10. Aggregates
11. Admixtures

    a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.

B. Design Mixtures: submit the following 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.
2. Method and test data used to establish mix proportions.
3. Concrete compressive strengths at 28 days or other age as specified.
4. Water/cement ratios, corresponding cement content, and water content.
5. Admixtures and additives
6. Slump or slump flow
7. Hot and cold weather designs if applicable
8. Air entrainment for each design
9. Ingredients, proportions, and source of materials.
10. Location and intended use.
11. Aggregate sieve analysis with graph

C. Steel Reinforcement Shop Drawings: 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.

D. Samples: For each of the following materials.

1. Vapor retarder.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer manufacturer.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Steel reinforcement and accessories.
4. Curing compounds.

5. Floor and slab treatments.
6. Bonding agents.
7. Adhesives.
8. Vapor retarders.
9. Repair materials.
10. Form materials and form-release agents.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity. Include aggregate sieve analysis with graph.

D. Mix Design Certification: Written and signed by batch plant quality control engineer or responsible agent. Certify that mix design conforms to provisions of this Section and that ingredients for each mix design are compatible.

E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

F. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. 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.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Batch Tickets: Conform to ASTM C94 option A or C. Accompany with each load, fully executed, and signed. Log in with inspector at time of entry. Conform to Source Quality Control requirements specified in this Section.

1. Include water content and water withheld at batch plant.
2. Indicate time to nearest minute that batch was dispatched from plant, when it arrived at site, when unlading began and when it finished.
3. Indicate ambient air temperature and concrete internal temperature at time of arrival.

4. Make written record of water and other additives added to design mix following the time the mix truck left the batch plant.

C. Reject concrete that has reached internal temperatures of 89 degree F or above and when temperature has risen 5 degrees F in 10 minutes, indicating concrete is setting up prior to discharge.

D. Store products in accordance with ACI 301. Do not use admixtures that have been in storage at project site for more than 6 months or which have been subject to freezing, except as accepted by the Architect and Structural Engineer based on test results.

1.9 FIELD CONDITIONS

A. 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 (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
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.

B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) 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. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.10 COORDINATION

A. Conform to Section 01 31 00 for coordination with work of other Sections.

B. Finish Flooring: Coordinate with carpeting, resilient tile flooring, sheet flooring, and other finish flooring systems to prevent moisture conditions, alkaline levels, and bond breaking & curing agents at interior concrete slabs are compatible with manufacturer’s warranty provisions.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301 (ACI 301M).
2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, fiberglass, metal, or other approved panel materials.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

    a. High-density overlay, Class 1 or better.

B. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

E. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.

F. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
2. Furnish ties that, when removed, leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.

G. Form Joint Tape: Compressible foam tape; pressure sensitive; AAMA 800; minimum 1/4 inch (6 mm) thick.

H. Form Joint Sealant: Elastomeric sealant complying with ASTM C920, Type M or Type S, Grade NS, that adheres to form joint substrates, does not stain, does not adversely affect concrete surfaces, and does not impair subsequent treatments and finishes of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60 (Grade 420), deformed bars, assembled with clips.

C. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports are required: 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:

1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

A. 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.

B. Cementitious Materials:

1. Portland Cement (Interior): ASTM C 150/C 150M, Type I/II or Type IL, gray.
2. Portland Cement (Exterior): ASTM C 150/C 150M, Type IA/IIA with specified air entrainment admixture; Type IIIA for cold weather construction, gray
3. Fly Ash: ASTM C 618, Class F.

C. Normal-Weight Aggregates: ASTM C 33/C 33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source. Provide well graded mixes, gap graded mixes are not acceptable. Mixes containing ¾" aggregate and sand will not be allowed.

1. Maximum Coarse-Aggregate Size: 1-inch nominal unless otherwise noted on the structural drawings.
2. Fine Aggregate: Free of deleterious substances or materials that may cause expansion of concrete or react with alkalis in concrete.

D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do 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.

E. Water: ASTM C 94/C 94M and potable.

2.6 VAPOR RETARDERS

A. Sheet Vapor Retarder for all slab-on-grade applications. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Barrier-Bac; Inteplast Group, Ltd.
    b. Fortifiber Building Systems Group.
    c. Grace Construction Products; W.R. Grace & Co. -- Conn.
    d. Insulation Solutions, Inc.
    e. Poly-America, L.P.
    f. Raven Industries, Inc.
    g. Reef Industries, Inc.
    h. Stego Industries, LLC.
    i. Tex-Trude, Inc.
    j. W. R. Meadows, Inc.

2. Water-Vapor Permeance: 0.03 Perms; ASTM E1745.
3. Water Vapor Retarder: Meets or exceeds Class A (ASTM E1745).
4. Retarder Thickness: Not less than 10 mils (ACI 302.1R-96).

2.7 ADMIXTURES, AGENTS, AND COMPOUNDS

A. Admixtures – General:

1. Provide products from single manufacturer, or supply manufacturer certification that admixtures are compatible in combination with cement and aggregates.
2. Free of calcium chloride and thiocyanate. Containing no more than 0.05 percent chloride ions.

B. Air-Entraining Agent: ASTM C260 for exterior concrete.

1. BASF Micro-Air or AE 90
2. Euclid, Air Mix
3. Grace, Daravair 1000
4. Sika, AEA-15

C. Superplasticisers:

1. Full-range water-reducing admixture, ASTM C494, Type F.

    a. BASF Gleniun 3030 NS

2. High-range water-reducing admixture, ASTM C494, Type F.

    a. BASF conforming to Type F.
    b. Euclid, Eucon 37
    c. Grace, Advaflow (WRDA-19)

d. Sika Sikament 86

3. Mid-range water-reducing admixture, ASTM C494, Type A or F.

a. BASF, Polyheed Series
b. Euclid, Eucon MR
c. Grace, Daracem

4. Low-range water-reducing admixture, ASTM C494, Type A.

a. BASF, Pozzolith 80 or 200N
b. Euclid, A+
c. Grace, WRDA 64 (WRDA with Hycol)

D. Shrinkage Reducing Admixture (SRA): Add at one gallon per cubic yard of concrete for mix designs conforming to accepted test data for linear shrinkage and as instructed by manufacturer for all Slab on Grade and Slab on Metal Deck.

1. BASF, Tetraguard AS20
2. Grace, Eclipse Plus and Eclipse Floor

2.8 LIQUID FLOOR TREATMENTS

A. 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Dayton Superior.
b. Euclid Chemical Company (The); an RPM company.
c. L&M Construction Chemicals, Inc.
d. US SPEC, Division of US MIX Company.
e. W. R. Meadows, Inc.

2.9 CURING MATERIALS

A. Accepted Curing Methods:

1. Conform to ACI 302.1R Section 9.2 using wet curing, wet covering, moisture retaining coverings, polyethylene film curing methods, using materials specified.
2. ACI 308, Section 2.2 – Water Curing or 2.3 – Sealing Materials using wet film curing methods.
3. Liquid-applied curing and sealing compounds.

B. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. BASF Corporation; Construction Systems, Confilm.
b. Dayton Superior, SureFilm J-74.

c. Euclid Chemical Company (The); an RPM company.
d. L&M Construction Chemicals, Inc, E-Con.
e. U.S. Mix, US SPEC MonoFilm ER.
f. W. R. Meadows, Inc, EVAPRE.

C. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

D. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

E. Water: Potable.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, non-dissipating**,** certified by curing compound manufacturer to not interfere with bonding of floor covering.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. BASF Corporation; Construction Systems.
b. Dayton Superior.
c. Euclid Chemical Company (The); an RPM company.
d. L&M Construction Chemicals, Inc.
e. W. R. Meadows, Inc.

2.10 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. 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. Types I and II, nonload bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

E. Joint Fillers and Sealers:

1. Exterior Recessed Joint Fillers: ASTM D1751, preformed asphalt impregnated joint filler.
2. Joint Sealant and Backer Rod: As specified in 07 92 00.

F. Epoxy Adhesive Anchor Systems:

1. Two Component Adhesive Anchor Systems: As specified on Structural Drawings. Shear and tensile bond strength to be greater than hardened concrete strength conforming to ASTM C882. Compatible for use with damp concrete.

G. Grouts:

1. Non-Shrink Grout under Structural Base and Bearing Plates and General Use:

a. As indicated in the structural drawings.

2.11 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150/C 150M, 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 (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi (29 MPa) 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 (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150/C 150M, 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 (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.12 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 (ACI 301M). When adjustment to mix design becomes necessary due to job conditions, weather, test results, changes in material properties, or other circumstances, resubmit new mix design for acceptance by Architect and Structural Engineer.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash (other than Slabs): 25 percent.
2. Fly Ash (Slabs and Pavements): 15 percent
3. Combined Fly Ash and Pozzolan: 25 percent.

C. 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.
3. Use water-reducing admixture in pumped concrete.
4. Use air entrained admixture in concrete that is exposed to freeze/thaw.
5. Use shrinkage reducing admixture for slabs on grade, slabs on deck, and non-structural topping over hollow core.

2.13 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. As indicated in Structural General Notes.

2.14 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.15 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116 and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
2. When adjustment to mix design becomes necessary due to job conditions, weather, test results, changes in material properties, or other circumstances, resubmit new mix design for acceptance of Architect and Structural Engineer.

2.16 SOURCE QUALITY CONTROL

A. Conform to provisions and limitations ACI 340R and ASTM C94.

B. Batching and Mixing: Conform to ASTM C94, Option A for exact proportioning of mix design.

C. Admixtures: Add to within accuracy of 3 percent.

1. Add separately and verify compatibility in design mix, conforming to manufacturer's instructions.
2. Reject concrete that shows signs of segregation due to use of admixtures.

D. Elapsed Time from Start of Batching at Plant to Discharge at Project Site: Conform to following except where set-reducing admixtures are added by batch plant for hauls requiring longer time periods.

1. Maximum 90 minutes and maximum 300 revolutions, whichever comes first after introducing mix water.
2. Air Temperatures:

    a. Reduce mixing and delivery time to maximum 75 minutes for between 85 degrees F and 90 degrees F.
    b. Reduce mixing and delivery time to 60 minutes for temperature above 90 Degrees F.
    c. Monitor concrete in truck and reject if temperature rises to 89 degrees or 5 degrees F in 10 minutes, indicating that concrete is setting up prior to discharge.

E. Mix Water: When feasible, add mix water required for mix design at batch plant.

F. Accelerating and Set Retarding Admixtures:

1. Accepted for long hauls for extending transportation time, cold weather, and hot weather conditions conforming to hot and cold weather placement requirements.
2. Measure concrete temperature and confirm that temperature has not exceeded 89 degrees F or 5 degrees F in 10 minutes before acceptance at site.

G. Batching of Dry Materials and Adding Mix Water at Site:

1. Accepted for long hauls and for extending transportation time as an alternative procedure to adding accelerating and set retarding mixtures.
2. Add mix water under pressure at both front and back of mixing drum.
3. Mix at mixing speed for 70 to 100 revolutions before discharging.

H. Adding Mix Water at Project Site:

1. Do not add water to batch plant mix design except as prescribed by batch plant mix designer's written instructions.
2. Add mix water only when Special Inspector is present.
3. Truck drivers and others are not authorized to add water, except under direct supervision of batch plant quality control representative present at project site.
4. Accurately meter mix water to exact quantity sufficient to reach slump specified by batch plant mix design. Do not exceed specified slump.
5. Do not exceed design water/cement ratio.

6. Make written record of water added to design mix and submit to Special Inspector at project site.

I. Do not use calcium chloride containing products.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify installation conditions as satisfactory to receive work of this Section before beginning.

B. Verify undamaged under slab vapor retarder conforming to Section 07 26 16. Sand and granular fill over vapor retarder not accepted.

C. Verify that anchors, seats, plates, reinforcement, and other items cast into concrete are accurately located and are securely in place.

3.2 PREPARATION

A. Protect Surrounding Areas: Preclude damage from work of this Section.

B. Interior Slab-On-Grade: Install vapor retarder sheeting specified under work of Section 07 26 00 directly under concrete slab.

C. Damaged Vapor Retarder: Lap new vapor retarder, 6 inch minimum, over damaged areas and seal with manufacturers standard tape.

D. New Concrete Cast Against Existing: Clean concrete with steel brush and apply bonding agent as instructed by manufacturer prior to placement of new concrete.

E. Formwork, Reinforcing, and Embedded Items: In place, and approved before placement of concrete.

3.3 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), 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 A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. 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. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

M. Place form liners accurately to provide finished surface texture indicated.

1. Provide solid backing and attach securely to prevent deflection and maintain stability of liners during concreting.
2. Secure form liners in place suing fasteners that will not transfer impressions onto surface of concrete.
3. Prevent form liners from sagging and stretching in hot weather.
4. Seal joints of form liners and form-liner accessories to prevent mortar leaks.
5. Coat form liner with form-release agent.

3.4 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 303.

3.5 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, 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 (10 deg C) 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 beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
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 are not 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.

3.6 VAPOR-RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 12 inches (300 mm) and seal with manufacturer's recommended tape.

3.7 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that 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.

3.8 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 (38 mm) into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints per the structural drawing located per the Architect.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Section 07 92 00 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 (ACI 301M).

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is 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 not to 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 (ACI 301M).
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 (150 mm) 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.

E. 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.

F. Cold-Weather Placement: Comply with SCI 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 (4.4 deg C) for three successive days, maintain delivered concrete moisture 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.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chipped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces 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.

C. Form-liner Finish: Produce a textured surface free of pockets, streaks, and honeycombs and of uniform appearance, color, and textures.

3.11 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. Screed to specified floor levelness and flatness tolerances.

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 or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:

    a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.

3. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch (3.2 mm).

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset 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.
2. Apply fine broom finish to all exposed concrete floors.

3.12 MISCELLANEOUS CONCRETE ITEM INSTALLATION

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. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 4 inches (100 mm) high unless otherwise indicated, and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.13 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 (ACI 301M) for hot-weather protection during curing. Polished slabs shall be wet cured and pour areas shall not exceed 4000 square feet in area where radiant floor heating is present.

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. x h (1 kg/sq. m x h) 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 remainder of 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 (300-mm) 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 (300 mm), 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. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does 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.
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.
5. Protect corners, edges, and surfaces of cast-in-place concrete from damage; use guards and barricades.
6. Protect cast-in-place concrete from staining, laitance, and contamination during remainder of construction period.
7. Clean cast-in-place concrete surfaces after finish treatment to remove stains, marking, dust, and debris.
8. Wash and rinse surfaces according to concrete finish applicator’s written instructions. Protect other Work from staining or damage due to cleaning operations.

a. Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least [**one**] [**six**] month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 GROUTING

A. Solid Grouting Under Structural Base Plates, Mechanical Equipment and Obstructed Voids and Joints.

1. Mix grout to fluid consistency.
2. Construct liquid tight formwork and pour grout in place.
3. To prevent voids, pour grout from only one side so that flow exists from opposite side. Work poured grout firmly in place.
4. Dry packing not permitted.

B. General Use: Include anchoring, filling cracks, and repairs such as filling rock pockets and pipe penetrations:

1. Mix non-shrink, aggregate grout to optimal fluid, flowable, or plastic consistency as necessary for solid grouting and repair.
2. Trowel grout at plastic consistency at voids and around pipe penetrations to fill voids and to match adjacent surfaces.

3.16 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 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and 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 (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). 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 matches 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 (0.25 mm) 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 (6 mm) 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 (25 mm) 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 (19-mm) 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 (25 mm) 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.

3.17 TOLERANCES

A. General Tolerances: Conform to ACI 117 and ACI 302.1R for tolerances of construction and materials.

B. Vertical, Lateral, and Relative Alignment and Cross Sectional Dimensions: Conform to ACI 117 and as specified for offset between adjacent formwork facing material.

C. Floor Slab Tolerances: Conform to ACI 302.1R and ACI 117 for Floor Flatness and Floor Levelness tolerance. Measure and test to ASTM E1155 within 72 hours after placing concrete slab and prior to removal of forms.

D. F_L Tolerances: Do not apply to inclined slabs, cambered slabs, and deflecting or unshored slabs.

3.18 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel reinforcement placement.
2. Headed bolts and studs.
3. Verification of use of required design mixture.
4. Concrete placement, including conveying and depositing.
5. Curing procedures and maintenance of curing temperature.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing provides 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.

2. 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.
3. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below or 80 deg F (27 deg C) and above, and one test for each composite sample.

5. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

6. 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 (3.4 MPa).
7. 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.
8. 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.
9. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
10. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
11. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 48 hours of finishing.

3.19 PROTECTION OF LIQUID FLOOR TREATMENTS

A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 033000

SECTION 042000 - UNIT MASONRY

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. Concrete masonry units.
2. Mortar and grout.
3. Steel reinforcing bars.
4. Ties and anchors.
5. Brick.
6. Miscellaneous masonry accessories.
7. Masonry-cell insulation.
8. Reinforcing Bar Positioners

B. Related Requirements:

1. Section 07 21 00 “Insulation”
2. Section 07 25 00 “Weather Barriers”
3. Section 07 62 00 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing.

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

1. Bracing at top of non-load bearing masonry walls, furnished under Division 05 Section 05 50 00 “Metal Fabrications.”

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For the following:

1. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.Show elevations of reinforced walls.

C. Samples for Verification: For each type and color of the following:

1. Exposed and Decorative CMUs.
2. Weep holes.
3. Accessories embedded in masonry.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Material Certificates: For each type and size of the following:

1. Masonry units.

a. Include data on material properties and material test reports substantiating compliance with requirements.
b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.

2. Cementitious materials. Include name of manufacturer, brand name, and type.
3. Mortar admixtures.
4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
5. Grout mixes. Include description of type and proportions of ingredients.
6. Reinforcing bars.
7. Anchors, ties, and metal accessories.

C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

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

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

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

1.9 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602.
2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

2.3 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602, except as modified by requirements in the Contract Documents.

2.4 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide bullnose units for interior outside corners unless noted otherwise.

B. CMUs: ASTM C 90.

1. Unit Compressive Strength: As specified in Structural General Notes.
2. Density Classification: As specified in Structural General Notes.

3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

    a. Standard pattern, smooth-face finish per Finishes Legend.
    b. Standard pattern, ground-face finish per Finish Legend.

5. Colors: Match Architect’s samples; reference Finish Legend.

C. Decorative CMUs: ASTM C90.

1. Unit Compressive Strength: As specified in Structural General Notes.
2. Density Classification: As specified in Structural General Notes.
3. Size (width): Manufactured to dimensions 3/8-inch less than nominal dimensions.
4. Pattern and Texture: As indicated in documents.
5. Colors: Match Architect’s samples; reference Finish Legend.

D. CMU Types: See Finish Legend.

2.5 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Mortar Cement: ASTM C 1329/C 1329M.

E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.

F. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

G. Aggregate for Grout: ASTM C 404.

H. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for glazed or pre-faced masonry units (and approved for such use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.

I. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

J. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer at exterior exposed CMU.

K. Water: Potable.

2.6 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

C. Masonry-Joint Reinforcement for Veneer not laid up in running bond: Single 0.148-inch-diameter, hot-dip galvanized carbon steel continuous wire.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).

B. Weep/Cavity Vent Products: Use the following unless otherwise indicated:

1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.

C. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Configuration: Provide one of the following:

a. Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.
b. Strips, not less than 3/4 inch (19 mm) thick and 10 inches (250 mm) high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.

2.9 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and section 07 62 00 "Sheet Metal Flashing and Trim" as follows:

1. Stainless Steel: ASTM A240 or ASTM A666, Type 304, 0.016 inch thick.
2. Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.7 m). Provide splice plates at joints of formed, smooth metal flashing.
3. Fabricate through-wall metal flashing embedded in masonry from stainless steel, with ribs at 3-inch (76 mm) intervals along length of flashing to provide an integral mortar bond.
4. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
5. Fabricate through-wall flashing, minimum 3 inches into wall, with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch (13 mm) out from will, with outer edge bent down 30 degrees and hemmed.
6. Fabricate through-wall flashing with sealant stop where indicated. Fabricate by bending metal back on itself 3/4 inch (19 mm) at exterior face of wall and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
7. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches (76 mm) into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam sheds water.
8. Fabricate metal expansion-joint strips from stainless steel to shapes indicated.
9. Solder metal items at corners.

B. Flexible Flashing: Use the following unless otherwise indicated:

1. Self-Adhering, Stainless Steel Fabric Flashing: Composite, flashing product consisting of 2 mil (0.05 mm) of Type 304 stainless steel sheet, bonded to a layer of polymeric fabric with a butyl adhesive, to produce an overall thickness of 10 mil (0.25 mm) or 40 mil (1.0 mm).

    a. Applications: Use 10-mil- (0.25-mm-) thick flashing at windows, doors, and small wall penetrations; not at base of walls. Use 40-mil- (1.0-mm-) thick flashing at base of walls.
    b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
    c. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Advanced Building Products Inc.
        2) Hohmann & Barnard, Inc.
        3) York Manufacturing, Inc.

2. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 35 mil (0.89 mm) or 40 mil (1.0 mm).

a. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
b. Manufacturers:

1) Advanced Building Products Inc.
2) Hohmann & Barnard, Inc.
3) York Manufacturing, Inc.

C. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counterflashing, use metal flashing.
2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge or flexible flashing with a metal drip edge.
4. Where flashing is fully concealed, use flexible flashing.

D. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Mortar Net Solutions.

E. Solder and Sealants for Sheet Metal Flashings:

1. Solder for stainless steel: ASTM B 32, Grade Sn60 with acid flux of type recommended by stainless steel sheet manufacturer.

F. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

G. Termination Bars for Flexible Flashing: Stainless steel bars 1/8 inch by 1 inch (3.2 mm by 25 mm).

2.10 MASONRY-CELL INSULATION

A. Foamed-In-Place Insulation:

1. Manufacturer: Provide product meeting this specification as manufactured by PolyMaster, Inc., 1043 Lexington Drive, Knoxville, TN 37932.
2. Foamed-in-Place Insulation: PolyMaster R-501, three part polymer foamed in place plastic insulation, a component dry powder resin combined on site with a catalyst and compressed air to meet the following:

a. Thermal Properties per inch thickness: ASTM C 177:

1) .208 K value at 25 degrees F.
2) .227 K value at 75 degrees F.
3) 5.0 R value at 25 degrees F.
4) 4.6 R value at 75 degrees F.

b. Flammability Classification: ASTM E 84:

1) Flame Spread: 5.
2) Fuel Contribution: 0.
3) Smoke Development: 10.
4) Classification: Class 1.

c. Maximum Shrinkage Allowable: 2% maximum.
d. Water Vapor Transmission: ASTM E 96; 6.36 perms/inch.
e. Water Vapor Absorption: ASTM 2482; 10% by volume at 24 hours/25 degrees F @ 100% RH.
f. Environmental Properties of Cured Product:

1) Non-corrosive.
2) No asbestos or glass fibers.
3) No off-gassing or odor.
4) Formaldehyde and urethane free.
5) Biodegradable.

3. Location: At exterior masonry walls.

2.10 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.11 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with the ASTM C 270 Specification. Provide Type S mortar for all applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

D. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
3. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m) or 1/4 inch in 20 feet, (6 mm in 6 m) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m) maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Start units on the foundation with partial height units as required so that block starts as a full course at finish floor and above.

C. Bond Pattern for Exposed Masonry: As indicated in documents; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

E. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

F. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

G. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

H. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

I. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay CMU as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Set precast concrete trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Allow cleaned surfaces to dry before setting.
3. Wet joint surfaces thoroughly before applying mortar.
4. Rake out mortar joints for pointing with sealant.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

E. Cut joints flush where indicated to receive cavity wall insulation unless otherwise indicated.

3.6 MASONRY-CELL INSULATION

A. Examination:

1. Ensure cores or spaces are free of mortar or other restrictions to the free flow of foam insulation.
2. Verify that all work within the wall voids is complete prior to installation.
3. Examine walls and cavities to determine if there are conditions which would adversely affect the performance of the installation. Do not proceed with installation until all unsatisfactory conditions have been corrected.

B. Preparation:

1. Mortar: Mortar and masonry must be relatively set prior to installation of insulation.
2. Cores and Wythes: Keep free from obstructions.
3. Pressure Fill Installation: Drill fill holes in masonry in accordance with manufacturer's recommendations.
4. Hole Size: Minimum 5/8 inch diameter, maximum 2 inch diameter.
5. Hole Spacing: One per core at 48 inches (midpoint of 8 feet vertical intervals).

C. Installation:

1. Install foam insulation in accordance with manufacturer's instructions, to completely fill space and to flow into all crevices and voids.
2. Use top fill or side pressure fill methods. Fill and point drill holes after installation, if pressure fill method is used.
3. Remove and dispose of any excess insulation outside of cavity.

D. Field Quality Control:

1. Sampling: Verify insulation density by random sampling.
2. One gallon of fresh foam shall weigh no less than 325 grams.
3. Check for complete filling of voids by drilling or removal of block face upon request.

E. Protection:

1. Protect finished work from damage until final inspection.
2. Do not permit subsequent construction to disturb insulation in place.
3. Allow 72 hours minimum after installation before painting of masonry walls.

3.7 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.

3.8 WEEP / CAVITY VENT PRODUCTS

A. General: Install weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated at top of wall assemblies.

B. Install weep holes in exterior wythes and veneers in head joints of first course of masonry.

1. Use specified weep/cavity vent products to form weep holes.

C. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

3.9 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 64 inches.

3.10 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Inspections: Special inspections according to Level B in TMS 402.

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.

E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

G. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.

H. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

I. Prism Test: For each type of construction provided, according to ASTM C 1314 at28 days.

3.11 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.

5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
7. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
8. Clean stone trim to comply with stone supplier's written instructions.
9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.12 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION 042000

SECTION 061000 - ROUGH CARPENTRY

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. Wood blocking and nailers.
2. Plywood backing panels.

B. Related Requirements:

1. Section 06 16 00 "Sheathing" for roof sheathing.

1.3 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.

C. Exposed Framing: Framing not concealed by other construction.

D. OSB: Oriented strand board.

E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. 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 D5664.
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.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.
4. Power-driven fasteners.
5. Post-installed anchors.
6. Metal framing anchors.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products 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, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber 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. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

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.
2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

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, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 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. Furring.
4. Grounds.

B. Dimension Lumber Items:

1. Grade and species as indicated on structural drawings.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.4 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.5 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall 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 A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, as appropriate for the substrate.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2 (ASTM F738M and ASTM F836M, Grade A1 or A4).

2.6 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.

B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.

C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

D. 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.

E. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal (38-mm actual) thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.

F. 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.

G. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 INSTALLATION OF WOOD FURRING

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

B. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring vertically at 16 inches (406 mm) 400 mm o.c.

3.4 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 wet, 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. 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. Roof sheathing.
2. Sheathing joint and penetration treatment.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for plywood backing panels.

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 plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated plywood.

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 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 WOOD PANEL PRODUCTS

A. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

B. Factory mark panels to indicate compliance with applicable standard.

2.2 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC3b for exterior construction not in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.3 ROOF SHEATHING

A. Plywood Sheathing: Per Structural General Notes.

B. Oriented-Strand-Board Sheathing: Per Structural General Notes.

2.4 FASTENERS

A. General: Provide fasteners as specified on the drawings. If fastening is not specifically noted, refer to the IBC Fastening Schedule, Table 2304.9.1 on S-002.

2.5 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

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. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

D. Use common wire 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. Install fasteners without splitting wood.

E. Coordinate wall parapet and roof 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.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. 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 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.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall and Roof Sheathing:

a. Nail to wood framing.
b. Space panels 1/8 inch (3 mm) apart at edges and ends.

END OF SECTION 061600

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SECTION 072100 - INSULATION

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. Perimeter foundation wall insulation.
2. Concealed building insulation (board and blanket).

B. Related Requirements:

1. Section 04 20 00 "Unit Masonry" for insulation installed in masonry cells.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 DEFINITIONS

A. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blanket with latter formed into batts (flat-cut lengths) or rolls.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD (Rigid Insulation at foundations walls & continuous wall insulation at exterior walls)

A. Extruded polystyrene boards in this article are also called "XPS boards." Roman numeral designators in ASTM C 578 are assigned in a fixed random sequence, and their numeric order does not reflect increasing strength or other characteristics.

B. Extruded Polystyrene Board, Type IV: ASTM C 578, Type IV, 25-psi (173-kPa) minimum compressive strength; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. DiversiFoam Products.
b. Dow Chemical Company (The).
c. Kingspan Insulation.
d. Owens Corning.

2. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 GLASS-FIBER BLANKET (Concealed Insulation at Framed Walls and Soffits)

A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CertainTeed Corporation.
b. Guardian Building Products, Inc.
c. Johns Manville; a Berkshire Hathaway company.
d. Knauf Insulation.
e. Owens Corning.

2.3 GLASS-FIBER BLANKET

A. Glass-Fiber Blanket, Polypropylene-Scrim-Kraft Faced (Exposed Insulation at Framed Walls and Roof Trusses): ASTM C665, Type II (nonreflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or 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.

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. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

E. 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.

F. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

G. Set vapor-retarder-faced units with vapor retarder in location indicated of construction, unless otherwise indicated.

H. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.

I. Ensure insulation rating product labels are visible for inspection.

3.3 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. 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. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For metal-framed wall cavities where cavity heights exceed 96-inches (2,438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
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.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb./cu. ft. (40 kg/cu. m).
2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.5 INSTALLATION OF VAPOR RETARDERS

A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

B. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (400 mm) o.c.

C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.

D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

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

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SECTION 072500 - WEATHER BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Building wrap (air barrier).
2. Self-adhering sheet flashing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For building wrap, include data on air and water-vapor permeance based on testing according to referenced standards.

PART 2 - PRODUCTS

2.1 WATER-RESISTIVE BARRIER

A. Building Wrap: ASTM E 1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Chemical Company (The); Styrofoam Weathermate Plus Brand Housewrap.
b. DuPont (E. I. du Pont de Nemours and Company); Tyvek CommercialWrap.
c. Ludlow Coated Products; Air Stop Housewrap.
d. Pactiv, Inc.; GreenGuard Classic Wrap.
e. Raven Industries Inc.; Fortress Pro Weather Protective Barrier.
f. Reemay, Inc.; Typar HouseWrap.

2. Water-Vapor Permeance: Not less than 50 g through 1 sq. m of surface in 24 hours per ASTM E 96/E 96M, Desiccant Method (Procedure A).
3. Allowable UV Exposure Time: Not less than three months.
4. Air Permeance: Not more than 0.004 cfm/sq. ft. at 0.3-inch wg (0.02 L/s x sq. m at 75 Pa) when tested according to ASTM E2178.

5. Flame Propagation

B. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

2.2 MISCELLANEOUS MATERIALS

A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.030 inch (0.8 mm).

1. Products: Subject to compliance with requirements, provide one of the following:

a. DuPont (E. I. du Pont de Nemours and Company); DuPont Flashing Tape.
b. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Vycor Butyl Self Adhered Flashing.
c. Raven Industries Inc.; Fortress Flashshield.
d. Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
e. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Vycor Plus Self-Adhered Flashing.

B. Primer for Flexible Flashing: Product recommended by manufacturer of flexible flashing for substrate.

C. Nails and Staples: ASTM F 1667.

PART 3 - EXECUTION

3.1 WATER-RESISTIVE BARRIER INSTALLATION

A. Cover sheathing with water-resistive barrier as follows:

1. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
2. Apply barrier to cover vertical flashing with a minimum 4-inch (100-mm) overlap unless otherwise indicated.

B. Building Wrap (air barrier): Comply with manufacturer's written instructions.

1. Seal seams, edges, fasteners, and penetrations with tape.
2. Extend into jambs of openings and seal corners with tape.

3.2 FLEXIBLE FLASHING INSTALLATION

A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.

1. Prime substrates as recommended by flashing manufacturer.

2. Lap seams and junctures with other materials at least 4 inches (100 mm) except that at flashing flanges of other construction, laps need not exceed flange width.
3. Lap flashing over water-resistive barrier at bottom and sides of openings.
4. Lap water-resistive barrier over flashing at heads of openings.
5. After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.
6. Install at all openings in exterior walls.

END OF SECTION 072500

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SECTION 074113.16 - STANDING-SEAM METAL ROOF AND SOFFIT PANELS

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. Standing-seam metal roof and soffit panels. (MRP-1)

B. Related Sections:

1. Section 07 42 13.13 "Formed Metal Wall and Soffit Panels" for metal panels used in horizontal and vertical soffit applications.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
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 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 structural loading limitations of deck during and after roofing.
6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
8. Review temporary protection requirements for metal panel systems during and after installation.
9. Review procedures for repair of metal panels damaged after installation.
10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches (305 mm) long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical roof area and eave, including fascia, as shown on Drawings; approximately 12 feet (3.5 m) square by full thickness, including attachments, insulation, and accessories.
2. Build mockups for typical roof area only, including accessories.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems 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 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 Delta E units when tested according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:

1. Wind Loads: As indicated on Drawings.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E1680 or ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E1646 or ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).

D. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E2140.

E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 90.

F. 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.

2.2 STANDING-SEAM METAL ROOF PANELS

A. Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E1514.

B. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and snapping panels together.

1. Basis-of-Design: AEP Span, Design – Span H.P.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Advanced Architectural Products.
    b. Architectural Building Components.
    c. Architectural Metal Systems.
    d. CENTRIA Architectural Systems.
    e. Fabral.
    f. Metal Sales Manufacturing Corporation.
    g. PAC-CLAD; Petersen Aluminum Corporation; a Carlisle company.
    h. Ryerson Tull, Inc.
    i. VICWEST.

3. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.

    a. Nominal Thickness: 22 GA (0.0294 inches)
    b. Exterior Finish: Two-coat fluoropolymer.
    c. Color: Match Architect's samples. Reference Finish Legend.

4. Panel Coverage: 18 inches (457 mm).
5. Panel Height: 1-3/4-inches.

2.3 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils (0.76 mm) thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D1970.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Carlisle WIP Products; a brand of Carlisle Construction Materials.
    b. GCP Applied Technologies Inc.
    c. Henry Company.
    d. Metal-Fab Manufacturing, a Drexel Metals Company.
    e. Owens Corning.
    f. Protecto Wrap Company.
    g. SDP Advanced Polymer Products Inc.

B. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.4 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645; cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A792/A792M, Class AZ50 (Class AZM150) coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Roof Curbs: Fabricated from same material as roof panels, 0.048-inch (1.2-mm) nominal thickness; with bottom of skirt profiled to match roof panel profiles and with welded top box and integral full-length cricket. Fabricate curb subframing of 0.060-inch- (1.52-mm-) nominal thickness, angle-, C-, or Z-shaped steel sheet. Fabricate curb and subframing to withstand indicated loads of size and height indicated. Finish roof curbs to match metal roof panels.

1. Insulate roof curb with 1-inch- (25-mm-) thick, rigid insulation.

E. Panel Fasteners: Self-tapping screws designed to withstand design loads.

F. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.5 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, 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.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and 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. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. 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.

C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. 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).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.

2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

    a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF UNDERLAYMENT

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches (152 mm) staggered 24 inches (610 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

1. Apply over the entire roof surface.

B. Slip Sheet: Apply slip sheet over underlayment before installing metal roof panels.

C. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 07 62 00 "Sheet Metal Flashing and Trim."

3.4 INSTALLATION OF STANDING SEAM METAL ROOF PANELS

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal 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 panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.

6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
3. Copper Panels: Use copper, stainless steel, or hardware-bronze fasteners.
4. Stainless Steel Panels: Use stainless steel fasteners.

C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
4. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
5. Watertight Installation:

    a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
    b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
    c. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: 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 panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.

G. 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 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 achieve 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).

H. Roof Curbs: Install flashing around bases where they meet metal roof panels.

I. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.

B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.

C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113.16

SECTION 074213.13 - FORMED METAL WALL AND SOFFIT PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal panels with no perforations and exposed fasteners (MWP-1).
2. Metal panels with perforations and exposed fasteners (MWP-2).

B. Related Sections:

1. Division 7 Section "Sheet Metal Flashing and Trim" for flashing and other sheet metal work that is not part of metal wall panel assemblies.

1.3 DEFINITION

A. Metal Wall Panel Assembly: Metal panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight wall system.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Metal panel assemblies shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Delegated Design: Design metal panel assembly, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of wall area when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft.

D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

E. Water Penetration under Dynamic Pressure: No evidence of water leakage when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of inward-acting, wind-load design pressure of not less than 6.24 lbf/sq. ft. and not more than 12 lbf/sq. ft.

1. Water Leakage: As defined according to AAMA 501.1.
2. Water Leakage: Uncontrolled water infiltrating the system or appearing on system's normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained back to the exterior and cannot damage adjacent materials or finishes is not water leakage.

F. Structural Performance: Provide metal panel assemblies capable of withstanding the effects the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:

1. Wind Loads: Determine loads based on the following minimum design wind pressures:

a. Uniform pressure of 30 lbf/sq. ft., acting inward or outward.

2. Deflection Limits: Metal wall panel assemblies shall withstand wind loads with horizontal deflections no greater than 1/180 of the span.

G. 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, ambient; 180 deg F, material surfaces.

1.5 ACTION 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 wall panel and accessory.

B. Shop Drawings: Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory, shop and field assembled work.

1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:

a. Flashing and trim.
b. Anchorage systems.

C. Samples for Initial Selection: For color-anodized aluminum, demonstrating range of color and mechanical finishes typical to material, fabrication and finishing processes to be used for final Work.

1. Sheet Aluminum: Prepare on 12-inch-square samples, of thickness as specified for the Work.
2. Extruded Aluminum: Prepare on 12-inch long extruded sections [with mullion cap].
3. Architect will select 3 samples each for aluminum sheet and extruded aluminum profiles and for each color representing acceptable range of colors and other aesthetic qualities.
4. Include similar Samples of trim and accessories involving color selection.
5. Include manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each sealant exposed to view.

D. Samples for Verification: Submit samples for verification and approval by Architect for use in final Work.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Field quality-control reports.

C. Maintenance Data: For metal panels to include in maintenance manuals.

D. Warranties: Sample of special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

C. Source Limitations: Obtain each type of metal panel from single source from single manufacturer.

D. Fire-Resistance Ratings: Where indicated, provide metal panels 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.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panel for period of metal panel installation.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify locations of structural members and opening dimensions by field measurements before metal panel fabrication, and indicate measurements on Shop Drawings.

1.11 COORDINATION

A. Coordinate metal panel assemblies with flashing, trim and other adjoining work to provide a leak-proof, secure, and noncorrosive installation.

1.12 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal 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 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 EXPOSED-FASTENER, LAP-SEAM METAL PANELS

A. Provide factory-formed metal panels designated to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to support using exposed fasteners in side laps. Include accessories required for weathertight installation.

B. Corrugated-Profile, Exposed-Fastener Metal Wall and Soffit Panels: Formed with alternating curved ribs spaced at 2.67 inches (68 mm) o.c. across width of panel.

1. Basis-of-Design: Morin King Span. Subject to compliance with Division 1 requirements and this spec section, products from Metal Sales, AEP Span, Centralia, and other manufacturers may be considered.

C. Aluminum Sheet: Coil-coated sheet, ASTM B209 (ASTM B209M), alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

1. Used at perforated metal panel and in place of item D
2. Nominal Thickness: 0.040 (1.0 mm).
3. Exterior Finish: Two-coat fluoropolymer.
4. Color: See Finish Legend.
5. Panel Coverage: 36” and 37”

D. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.

a. Used only at solid metal wall and soffit panels.
b. Nominal Thickness: 0.028 (0.71 mm).
c. Exterior Finish: Two-coat fluoropolymer.
d. Color: See Finish Legend.
e. Panel Coverage: 36” and 37”

E. Panel Key:

1. MWP-1: HR-36. Solid with Fluoropolymer, see Finish Legend.
2. MWP-2: C-37. 10% perforations with fluoropolymer finish, see Finish Legend.
3. MSP-1: HR-36. Solid with Fluoropolymer, see Finish Legend

2.2 MISCELLANEOUS METAL FRAMING

A. Miscellaneous Metal Framing, General: ASTM C 645, cold-formed metallic-coated steel sheet, ASTM A 653/A 653M, G90 hot-dip galvanized or coating with equivalent corrosion resistance unless otherwise indicated.

B. Zee Clips: As indicated in documents.

C. Base or Sill Angles: As indicated in documents.

D. Hat-Shaped, Rigid Furring Channels:

1. Nominal Thickness: 0.025 inch.
2. Depth: As indicated.

E. Fasteners for Miscellaneous Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten miscellaneous metal framing members to substrates.

2.3 MISCELLANEOUS MATERIALS

A. Panel 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 wall panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.

B. Panel Sealants:

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inchwide and 1/8 inch thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal wall panels and remain weathertight; and as recommended in writing by metal wall panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.4 ACCESSORIES

A. Wall Panel Accessories: Provide components required for a complete metal 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 wall panels, unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal wall panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or premolded to match metal wall and roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

B. Flashing and Trim: Formed from 0.018-inch minimum thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet pre-painted 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 wall panels.

2.5 FABRICATION

A. General: Fabricate and finish metal 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.

B. Fabricate metal panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, and that will minimize noise from movements within panel assembly.

E. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the 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 Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
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, noncorrosive metal recommended by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application but not less than thickness of metal being secured.

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. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Apply finish to panels after perforated.

D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of 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 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 wall panel manufacturer.
3. Verify that weather-resistant sheathing paper has been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
4. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal wall panels before metal panel installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Framing: Install base angles, sills, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

1. Soffit Framing: Wire-tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

3.3 METAL WALL PANEL INSTALLATION

A. General: Install metal 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 metal wall 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 wall panels.
2. Flash and seal metal wall panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until weather barrier and flashings that will be concealed by metal wall panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal wall panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete and elsewhere as indicated or, if not indicated, as necessary for waterproofing.
8. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
9. Provide weathertight escutcheons for pipe and conduit penetrating exterior walls.
10. No sheets can be cut with an abrasive saw and all ends of panels must be cut with a factory approved sheer. Refinish sheared ends to prevent rusting.
11. Butt horizontal furring channels to allow 3/8” drainage gap. Stagger spaces between rows of horizontal furring channels.

B. Fasteners:

1. Steel Wall Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use 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 wall panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal wall panel manufacturer.

E. Clip-and Rail Installation: Attach panel clips and rails to supports at locations, spacings, and fasteners recommended by manufacturer. Attach flanges of metal plate wall panels to panel clips with fasteners, as recommended by manufacturer.

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 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 with no joints allowed within 24 inches 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 deep, filled with mastic sealant (concealed within joints).

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.13

SECTION 076200 - SHEET METAL FLASHING AND TRIM

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. Manufactured reglets with counterflashing.
2. Formed low-slope roof sheet metal fabrications.
3. Formed wall sheet metal fabrications.
4. Formed equipment support flashing.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches (1:10).

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation, Grade 40 (Grade 275); prepainted by coil-coating process to comply with ASTM A 755/A 755M.

1. Surface: Smooth, flat.
2. Exposed Coil-Coated Finish:

    a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

3. Color as indicated in Division 9, Finishes Legend.
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

C. Stainless Steel Sheet: ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.

1. Finish: ASTM A480/A480M, No. 4 (polished directional satin).

    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 to cross scratches.

        1) Run grain of directional finishes with long dimension of each piece.
        2) When polishing is complete, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.

B. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F (111 deg C); and complying with physical requirements of ASTM D 226/D 226M for Type I and Type II felts.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Atlas Roofing Corporation.
    b. Engineered Coated Products.
    c. Kirsch Building Products, LLC.
    d. SDP Advanced Polymer Products Inc.

C. Slip Sheet: Rosin-sized building paper, 3 lb./100 sq. ft. (0.16 kg/sq. m) minimum.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

    a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Solder:

1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane, polysulfide or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Cheney Flashing Company.
    b. Fry Reglet Corporation.
    c. Heckmann Building Products, Inc.
    d. Keystone Flashing Company, Inc.

2. Material: Stainless steel, 0.019 inch (0.48 mm) thick.
3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
4. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
5. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
6. Accessories:

    a. 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 Drawings show reglet without metal counterflashing.
    b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.

7. Finish: With manufacturer's standard color coating.

2.6 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.

4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

I. Do not use graphite pencils to mark metal surfaces.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch (100-mm) wide wall flanges to interior, and base extending 4-inches (100 mm) beyond cant or tapered strip into field of roof. Fabricate from the following materials:

1. Stainless Steel: 0.019 inch (0.48 mm) thick.

B. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, solder or weld watertight. Shop fabricate interior and exterior corners.

1. Coping Profile: Fig 3-4A according to SMACNA's "Architectural Sheet Metal Manual."
2. Joint Style: Butted with expansion space and 6-inch- (150-mm-) wide, concealed backup plate.
3. Fabricate from the Following Materials:

a. Pre-Painted, Metallic-Coated Steel: 0.0396 inch thick. Color as noted on Finishes Legend.

C. Roof and Roof-to-Wall Transition, Roof-to-Roof Edge-Flashing (Gravel-Stop) Transition Expansion-Joint Cover: Fabricate from the following materials: Shop fabricate interior and exterior corners.

1. Pre-Painted, Metallic-Coated Steel: 0.0396 inch thick. Color as noted on Finishes Legend.

D. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Pre-Painted, Metallic-Coated Steel: 0.0276 inch thick. Color as noted on Finishes Legend.

E. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Pre-Painted, Metallic-Coated Steel: 0.0217 inch thick. Color as noted on Finishes Legend.

F. Flashing Receivers: Fabricate from the following materials:

1. Pre-Painted, Metallic-Coated Steel: 0.0217 inch thick. Color as noted on Finishes Legend.

G. Roof-Penetration Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.019 inch (0.48 mm) thick.

H. Roof-Drain Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.016 inch (0.40 mm) thick.

I. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

1. Gutter Style: SMACNA designation B.
2. Expansion Joints: Butt type.
3. Accessories: Continuous removable leaf screen with sheet metal frame and hardware cloth screen and wire ball downspout strainer.
4. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following materials:
5. Expansion Joints: Butt type.
6. Accessories: Continuous removable leaf screen with sheet metal frame and hardware cloth screen and Wire ball downspout strainer.
7. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following material:

a. Prepainted, Metallic-Coated Steel: 0.0217 inch (0.55 mm) thick.
b. Color: See Finishes Legend.

J. Custom Downspouts: Fabricate downspouts complete with mitered elbows. Furnish with metal hangers and anchors.

1. Fabricate downspouts as detailed in the drawings from Schedule 40 galvanized pipe. Field paint downspout.

2.8 WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches (150 mm) beyond each side of wall openings; and form with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:

1. Stainless Steel: 0.016 inch (0.40 mm) thick.

2.9 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch (0.71 mm) thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch (0.71 mm) thick.

2.10 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:

1. Pre-Painted, Metallic-Coated Steel: 0.0276 inch thick. Color as noted on Finishes Legend.

B. Drip Edges:

1. Pre-Painted, Metallic-Coated Steel: 0.022 inch thick. Color as noted on Finishes Legend.

C. Metal Wrapped Columns (Brake Metal)

1. Pre-Painted, Metallic-Coated Steel: 0.06 inch thick. Match storefront and curtain wall framing color.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.

C. Apply slip sheet, wrinkle free, over underlayment or directly on substrate before installing sheet metal flashing and trim.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
2. Prepare joints and apply sealants to comply with requirements in Section 07 9 200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder pre-painted, metallic-coated steel and aluminum sheet.
2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
4. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 16-inch (400-mm) centers.

C. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

D. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch (600-mm) centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch (600-mm) centers.

E. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

F. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of anchor and washer at 36-inch (910-mm) centers unless otherwise indicated.

G. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.5 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Section 04 20 00 "Unit Masonry."

C. Reglets: Installation of reglets is specified in Section 04 20 00 "Unit Masonry."

3.6 MISCELLANEOUS FLASHING INSTALLATION

A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.8 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

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SECTION 079200 - JOINT SEALANTS

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. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.

B. Related Requirements:

1. Division 04 Section "Unit Masonry" for masonry control and expansion joint fillers and gaskets.
2. Division 08 Section "Glazing" for glazing sealants.
3. Civil Drawings, for sealing joints in paved roads, walkways, and curbing.

1.3 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.

C. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

D. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.7 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

E. Colors of Exposed Joint Sealants: As indicated in Division 9, Finishes Legend.

2.2 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 50, NT: Single-component, non-sag, plus 50 percent and minus 50 percent movement capability, non-traffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Dow Corning Corporation.
b. GE Construction Sealants; Momentive Performance Materials Inc.
c. May National Associates, Inc.; a subsidiary of Sika Corporation.
d. Pecora Corporation.
e. Sika Corporation; Joint Sealants.

2.3 URETHANE JOINT SEALANTS

A. Urethane, M, P, 25, T, NT: Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and non-traffic-use, urethane joint sealant; ASTM C 920, Type M, Grade P, Class 25, Uses T and NT.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. BASF Corporation; Construction Systems.
    b. Bostik, Inc.
    c. LymTal International Inc.
    d. Pecora Corporation.
    e. Sherwin-Williams Company (The).
    f. Sika Corporation; Joint Sealants.
    g. Tremco Incorporated.

2.4 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, non-sag, plus 25 percent and minus 25 percent movement capability, non-traffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Dow Corning Corporation.
    b. GE Construction Sealants; Momentive Performance Materials Inc.
    c. May National Associates, Inc.; a subsidiary of Sika Corporation.
    d. Soudal USA.
    e. Tremco Incorporated.

2.5 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. BASF Corporation; Construction Systems.
    b. Franklin International.
    c. May National Associates, Inc.; a subsidiary of Sika Corporation.
    d. Pecora Corporation.
    e. Sherwin-Williams Company (The).
    f. Tremco Incorporated.

2.6 ACOUSTICAL JOINT SEALANT

A. Manufacturer's standard non-sag, paintable, non-staining 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.

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. Pecora Corporation: AC-20 FTR.
2. USG Corporation. SHEETROCK Acoustical Sealant.
3. Tremco Inc.; Acoustical Sealant.

2.7 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Non-staining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. BASF Corporation; Construction Systems.
b. Construction Foam Products; a division of Nomaco, Inc.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.8 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: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

a. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

a. Whether sealants filled joint cavities and are free of voids.
b. Whether sealant dimensions and configurations comply with specified requirements.
c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:

a. Control and expansion joints in pavers.
b. Isolation and contraction joints in cast-in-place concrete slabs.
c. Joints between plant-precast architectural concrete paving units.
d. Joints in paving units, including steps.
e. Tile control and expansion joints.
f. Joints between different materials listed above.
g. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, M, P, 50, T.
3. Joint-Sealant Color: Match Architect's sample.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Locations:

a. Construction joints in cast-in-place concrete.
b. Joints between plant-precast architectural concrete units.
c. Control and expansion joints in unit masonry.
d. Joints between metal panels.
e. Joints between different materials listed above.
f. Perimeter joints between materials listed above and frames of doors, windows and louvers.
g. Control and expansion joints in ceilings and other overhead surfaces.
h. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
3. Joint-Sealant Color: Match Architect's sample.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

1. Joint Locations:

a. Isolation joints in cast-in-place concrete slabs.
b. Control and expansion joints in stone flooring.
c. Control and expansion joints in brick flooring.
d. Control and expansion joints in tile flooring.
e. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, M, P, 25, T.
3. Joint-Sealant Color: Match Architect's sample.

D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Locations:

a. Control and expansion joints on exposed interior surfaces of exterior walls.
b. Tile control and expansion joints.
c. Vertical joints on exposed surfaces of unit masonry, concrete walls and partitions.
d. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, S, NS, 25, NT.
3. Joint-Sealant Color: Match Architect's sample.

E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces not subject to significant movement.

1. Joint Locations:

a. Control joints on exposed interior surfaces of exterior walls.
b. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Acrylic latex.
3. Joint-Sealant Color: Match Architect's sample.

F. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Locations:

a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
b. Tile control and expansion joints where indicated.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
3. Joint-Sealant Color: Match Architect's sample.

G. Joint-Sealant Application: Concealed mastics.

1. Joint Locations:

a. Aluminum thresholds.
b. Sill plates.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Butyl-rubber based.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 08 22 10

FIBERGLASS REINFORCED DOOR AND FRAME SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fiberglass Reinforced Plastic (FRP) Doors.

B. Fiberglass Door Frames.

1.2 RELATED SECTIONS

A. Section 07 92 00 - Joint Sealers: Perimeter sealant and backup materials.

B. Section 08 71 00 - Door Hardware.

C. Section 08 80 00 - Glazing.

1.3 REFERENCES

A. ASTM D 523 - Standard Test Method for Specular Gloss.

B. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position.

C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. ASTM E 152 - Standard Methods of Fire Tests of Door Assemblies.

E. ASTM F 1642-04–Low Level Blast Resistance.

F. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

G. SDI 100 - Recommended Specifications for Steel Doors and Frames.

H. UL 10B - Standard for Fire Tests of Door Assemblies.

I. UL 305 - Standard for Panic Hardware.

1.4 PERFORMANCE REQUIREMENTS

A. Door opening assemblies:

1. Maximum flame spread 25 in accordance with ASTM E 84, self-extinguishing in accordance with ASTM D 635.

2. USDA accepted.

B. Non Rated assemblies: Comply with requirements of ASTM F 1642-04 and GSA- TSO1-2003 Low Level Blast Resistance, Test Reports Required.

1.5 SUBMITTALS

A. Submit Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

B. Shop Drawings:

1. Plans: Indicate location of each door opening assembly in project.
2. Elevations: Dimensioned elevation of each type door opening assembly in project; indicate sizes and locations of door hardware, and lites and louvers, if specified.
3. Details: Installation details of each type installation condition in project; indicate installation details of glazing, if specified.
4. Schedule: Indicate each door opening assembly in project; cross-reference to plans, elevations, and details.

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing fiberglass doors and frames with a minimum documented experience of 5 years.

B. Installer Qualifications: Company specializing in installation of fiberglass doors and frames with minimum three years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's unopened, undamaged packaging, with manufacturer's labels intact.

B. Inspect and report damage to doors at time of delivery.

C. Store products in manufacturer's unopened packaging until ready for installation.

D. Store door and window assemblies in one end, to prevent damage to face corners and edges.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer's 10-year warranty against failure due to corrosion from specified environment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: Fib-R-Dor, a Div. of Chase Doors, Inc.; 1721 East 5th Street, North Little Rock, AR 72114. Ph. Toll Free (800) 342-7367, Fax (501) 758-9496 Web Site: fibrdor@fibrdor.com.

B. Tiger Door, a Senneca Co.; 1181 Garden Street, Greensburg, PA 15601. Ph. (888) 891-4416, Web Site: www.tigerdoor.com

2.2 MATERIALS

A. Fiberglass Mat: Glass fiber chopped strand, minimum 2 ounces per square foot.

B. Resins: Manufacturer's formulation for fabricating units to meet specified requirements.

C. Anchors: Manufacturer's standard stainless steel masonry tee anchors for new construction.

D. Fasteners: Stainless steel.

E. Glazing: Type specified in Section 08 80 00; factory installed.

2.3 COMPONENTS

A. Non-rated Fiberglass Reinforced Plastic (FRP) Doors:

1. Thickness: 1-3/4 inches (45 mm).
2. Construction:

    a. Core: Polyurethane foam.
    Note: Gypsum core is utilized at Fire Rated door.
    b. Door Plates: Molded in one continuous piece, resin reinforced with hand-laid glass fiber mat, nominal 1/8 inch (3 mm) thick, minimum 25 mil gel-coated surface.
    c. Door Edges: Fiberglass mat reinforced, nominal 3/8 inch (9.5 mm) thick, machine tooled resin rich FRP matrix.

3. Thermal Insulating Value: Up to 'R' factor 11 at Foam Core.
4. U-Factor: 0.09
5. Sizes: Indicated on drawings.

B. Non-rated Fiberglass Frames:

1. Construction: One-piece pultruded fiberglass reinforced plastic, minimum 1/4 inch wall thickness, jamb-to-head joints mitered and reinforced with FRP clips and stainless steel fasteners; conforming to SDI requirements for performance equivalent to 16 gage steel frames.
   Note: Hollow metal frames in Stainless steel or Galvanneal are utilized at Fire Rated openings.
2. Frame profile: 5-3/4 inches (146 mm) deep, 2 inches (51 mm) wide face; double rabbeted with 5/8 inch (16 mm) high stop.
3. Sizes: Indicated on drawings.

C. Door Hardware: Specified Section 087100.

2.4 FABRICATION

A. Fiberglass Reinforced Plastic (FRP) Doors:

1. Minimum glass fiber to resin ratio: 35 percent.
2. Mortise for lockset, and recess for strike plate in lock stile.
3. Embed steel reinforcement for hinges in fiberglass matrix; provide for hinge leaf recesses in hinge stile.

B. Fiberglass Frames:

1. Mortise for lock strike, and recess for strike plate in lock jamb.
2. Reinforce for hinges and other indicated hardware.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify openings are ready to receive work and opening dimensions and clearances are as indicated on approved shop drawings. Do not begin installation until openings have been properly prepared.

B. If opening preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Acclimate doors and frames to site conditions for a minimum of 24 hours before installation.

B. Do not remove labels from fire-rated doors and frames.

3.3 INSTALLATION

A. Install door opening assemblies in accordance with approved shop drawings, SDI 100, and manufacturer's printed installation instructions, using installation methods and materials specified in installation instructions.

B. Use anchorage devices to securely fasten sliding door assembly to wall construction without distortion or imposed stresses.

C. Coordinate installation of thermal insulation at shim spaces at frame perimeter.

D. Installation of door hardware is specified in Section 08 71 00.

E. Install door hardware in accordance with manufacturer's printed instructions, using through-bolts to secure surface applied hardware.

F. Site Tolerances: Maintain plumb and level tolerances specified in manufacturer's printed installation instructions.

3.4 ADJUSTING

A. Adjust doors in accordance with door manufacturer's maintenance instructions to swing open and shut without binding, and to remain in place at any angle without being moved by gravitational influence.

B. Adjust door hardware to operate correctly in accordance with hardware manufacturer's maintenance instructions.

3.5 CLEANING

A. Clean surfaces of door opening assemblies and sight-exposed door hardware in accordance with manufacturer's maintenance instructions.

B. Remove labels and visible markings.

3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.7 SCHEDULE

A. Schedules: Refer to Door Schedule indicated on drawings.

END OF SECTION 082210

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SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 08 11 13 "Hollow Metal Doors & Frames"

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.

1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

a. Type, style, function, size, and finish of each hardware item.
b. Name and manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.
e. Explanation of all abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for hardware.
g. Door and frame sizes and materials.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural hardware consultant (AHC) who is available to Agency, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

1.5 PRODUCT HANDLING

A. Tag each item, or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

PART 2 – PRODUCTS

2.1 PRODUCT HANDLING

A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Packaging of hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate door number to match door numbers of approved hardware schedule.

C. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that the count is correct.

D. Deliver individually packaged items at the proper times to the proper locations (shop or project site) for installation.

E. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

2.2 MANUFACTURERS

A. The numbers shown in the hardware groups are taken from the catalogs of the following manufacturers and are for the purpose of establishing quality, design, function and finish. Except as listed, no substitutes will be allowed, unless approved by the architect prior to bid opening. No substitutions will be allowed after bid opening. Requests for approval must be made to the architect. All substitutions must be from hardware distributors, not factory representatives.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Butts and Hinges:

a. Bommer Industries, Inc.
b. Hager Hinge Co.
c. Ives
d. McKinney Products Co.
e. Stanley Hardware.

2. Locks:

a. Schlage Lock
b. Sargent Lock

3. Cylinders:

a. Schlage Lock to match existing system

4. Electronic Locks:

a. Schlage Lock
b. Sargent Lock

5. Overhead Closers:

a. LCN Closers
b. Stanley Closers

6. Door Control Devices:

a. Ives
b. Rockwood Manufacturing Co.
c. Triangle Brass Manufacturing Company (Trimco).
d. Glynn Johnson

7. Door Trim Units:

a. Ives
b. Rockwood Manufacturing Co.
c. Triangle Brass Manufacturing Company (Trimco).

8. Door Stripping and Seals:

a. National Guard Products, Inc.
b. Pemko Manufacturing Co., Inc.
c. Reese Enterprises, Inc.

9. Exit Devices:

a. Von Duprin
b. Sargent Lock

10. Door Viewer:

a. Advanced Safety Devices (ASD)

2.3 MATERIALS AND FABRICATION

A. Hand of Door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified standard applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designation indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

D. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.

E. Provide concealed fasteners for hardware units which are exposed when door is closed, except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.

F. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Agency's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.4 HINGES, BUTTS AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template produced units.

B. Screws: Furnish Phillips flat-head machine screws for installation of units, except furnish Phillips flat-head wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

1. Steel Hinges: Steel pins.
2. Non-ferrous Hinges: Stainless steel pins.
3. Out-swinging Lockable Doors: Non-removable pins.
4. Interior Doors: Non-rising pins.
5. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.

D. Number of Hinges: Provide number of hinges indicated but not less than one pair of hinges for each door up to 60" in height. Furnish one each additional hinge for every additional 30" or fraction thereof.

E. Continuous Hinges: Provide heavy duty full mortise type continuous hinges at all exterior openings and where noted in hardware sets.

2.5 LOCK CYLINDERS AND KEYING

A. General: Supplier will meet with Agency to finalize keying requirements and obtain final instructions in writing.

B. Review the keying system with the Agency and provide the type required (master, submaster and room specific), in existing master key system.

1. All locks shall be factory master keyed or keyed by a factory authorized agent.

C. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

D. Comply with Agency's instructions for master keying, and, except as otherwise indicated, provide individual change keys for each lock which is not designated to be keyed alike with a group of related locks. Construction Master Key all locks or provide temporary cylinders for use during the construction period.

E. Key Material: Provide keys of nickel and silver only.

F. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.

1. Deliver permanent keys to Agency or Agency's representative.

G. Provide a key control system including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of the number of locks required for the project.

1. Provide hinged-panel type cabinet, for wall mounting, similar to Telkee AWC-150S.

2.6 LOCKS, LATCHES AND BOLTS

A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware.

1. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.

B. Lock Throw: Provide 1/2" minimum throw of latchbolts on single doors, 1" minimum throw of deadbolts. Provide 3/4" minimum throw of latchbolts on UL rated pairs of doors where required by code.

C. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod door doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.

D. Exit Device Dogging: Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, equip the units with a keyed dogging device to hold the push bar down and the latch bolt in the open position.

E. Shim Kits: On doors with vision panels extending below the exit device mounting height, provide shim kits to space the exit device away from the door sufficient distance to clear the vision panel.

2.7 PUSH/PULL UNITS

A. Exposed fasteners: Provide manufacturer's standard exposed fasteners for installation; through-bolted for match pairs, but not for single units.

2.8 CLOSERS AND DOOR CONTROL DEVICES

A. Size of units. Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use. Provide parallel arms for all overhead closers except as otherwise noted. Furnish drop plates and accessories as required for project conditions.

2.9 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screws.

B. Fabricate protection plates (armor, kick or mop) not more than 2" less than door width on stop side and not more than 1/2' less than door width on pull side, x the height indicated.

1. Plastic Plates: Plastic laminate (polyester), 1/8" (0.125") thick, beveled on all four edges.

2.10 WEATHERSTRIPPING

A. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stock maintained by manufacturer.

2.11 THRESHOLDS

A. General: Except as otherwise indicated provide standard metal threshold unit of type, size and profile as shown or scheduled.

2.12 HARDWARE FINISHES

A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units) for color and texture.

B. Provide finishes which match those established by BHMA or, if none established, match the Architect's sample.

C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standard, but in no case less than specified for the applicable units of hardware by referenced standards.

D. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI A156.18 "Materials & Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

E. Hardware in general to be Dark Bronze or Black. Lock trim to be 626.

2.13 HARDWARE SETS

A. Hardware sets indicate quantity, item, manufacturer and product designation, size, and finish or color, as applicable.

HW 01 (DOORS 102, 106)

3	EA	HINGE	T4A3786 NRP 4.5 X 4.5	652	MCK
1	EA	STOREROOM LOCK	L9080P 06A	626	SCH
1	EA	CYLINDER			
1	EA	ELECTRIC STRIKE	MUNL	630	HES
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	OVERHEADSTOP	1005	630	GLY
1	SET	SEALS	S88D	DKB	PEM
1	EA	DOOR SWEEP	315CN	AL	PEM
1	EA	THRESHOLD	171A X PEMKOTE	AL	PEM
1	EA	DOOR VIEWER	DOOR SCOPE DS238	BLK	ASD
			ACCESS CONTROL BY OTHERS		

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount hardware units at heights indicated in Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and counter sink units which are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3.2 ADJUST AND CLEAN

A. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustments of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilation equipment.

B. Instruct Agency's personnel in proper adjustment and maintenance of hardware and hardware finish during the final adjustment of hardware.

C. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Agency's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials, or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

END SECTION 087100

SECTION 088000 - GLAZING

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. Glass for windows, doors, interior borrowed lites, curtainwall and storefront framing.
2. Glazing sealants and accessories.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 08 11 13 “Hollow Metal Doors and Frames”

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. IBC: International Building Code.

D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass the following products: 12 inches square.

C. Glazing Accessory Samples: For sealants, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer manufacturers of insulating-glass units with sputter-coated, low-E coatings.

B. Product Certificates: For glass.

C. Product Test Reports: For tinted glass, coated glass, insulating glass and glazing sealants, for tests performed by a qualified testing agency.

1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

D. Preconstruction adhesion and compatibility test report.

E. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.

B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.10 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cardinal Glass Industries.
2. Guardian Industries Corp.; SunGuard.
3. Hartung Glass Industries.
4. Oldcastle BuildingEnvelope™.
5. Pilkington North America.
6. Tecnoglass.
7. Vetrotech Saint-Gobain.
8. Viracon, Inc.
9. Vitro Architectural Glass

B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

1. Obtain tinted glass from single source from single manufacturer.

C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.

1. Design Wind Pressures: As indicated on Structural General Notes.
2. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings.

    a. Wind Design Data: As indicated on Structural General Notes.

3. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
4. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

C. Safety Glazing: Where safety glazing is required by IBC Section 2406, provide glazing that complies with 16 CFR 1201, Category II.

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

1. For monolithic-glass lites, properties are based on units with lites of thickness indicated.
2. For laminated-glass lites, properties are based on products of construction indicated.
3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
3. ASTM E2010-01: Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.
4. NFPA 80: Fire Doors and Windows.

5. NFPA 257 – Fire Tests of Window Assemblies.
6. UL 9 – Fire Tests of Window Assemblies

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

1. Minimum Glass Thickness for Exterior Lites: 6 mm.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Float Glass (Symbol F): ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

B. Heat-Treated Float Glass (Symbol T): ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
2. For uncoated glass, comply with requirements for Condition A.

C. Laminated Glass (Symbol L): ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written recommendations.
2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

D. Insulating-Glass Units (Symbol IG-1): Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.

1. Basis of Specification: Solarban 67(2) Clear + Clear, Vitro Architectural Glass. Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article.

    a. Overall Unit Thickness: 1 inch.
    b. Thickness of Each Lite: ¼ inch (1 lite) and 1/4" (1 lite).
    c. Interspace Content: Air.
    d. Indoor Lite: Coated Float Glass.
    e. Outdoor Lite: Clear Float Glass.
    f. Low E Coating: Second Surface.

2. Provide Kind FT (fully tempered) on inside and outside light where safety glass is required.
3. Performance: Comply with the following requirements:

    a. Visible Light Transmittance (Tv): 54%.
    b. Winter U-Value: .29.
    c. Solar Heat Gain Coefficient (SHGC): .29.
    d. Reflectance Visible Light-Exterior: 19%, Interior: 16%.

2.5 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. BASF Corporation; Construction Systems.
    b. Dow Corning Corporation.
    c. GE Construction Sealants; Momentive Performance Materials Inc.
    d. May National Associates, Inc.; a subsidiary of Sika Corporation.
    e. Pecora Corporation.
    f. Polymeric Systems, Inc.
    g. Sika Corporation.
    h. Tremco Incorporated.

2. Applications: Non-fire rated openings.

2.6 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; non-staining and non-migrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.7 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

2.8 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inchminimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.7 GLASS SCHEDULE

SYMBOL	TYPE	LOCATION (Where indicated and:)
	Float Glass	Typical interior
IG-1	1" insulating, Clear, low E coated	Exterior, typical except where otherwise indicated. Tempered, Low E coated where required by IBC 2406 5/8" thick in doors.

END OF SECTION 088000

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Spec. Section	Item	Keyword	Manufacturer	Description	Color/Finish
03 30 00	Cast-In-Place Concrete				
	Sealed Concrete	SC			Clear Sealed
04 20 00	Unit Masonry				
		CMU-1	Mutual Materials	3 5/8” x 7 5/8” x 15 5/8”; Running Bond	Chestnut / Mission
07 41 13.16	Standing-Seam Metal Roof Panels				
		MRP-1	AEP Span	Design-Lock HP	Match MWP-1
07 42 13.13	Formed Metal Wall and Soffit Panels				
		MWP-1	MBCI	FlexLoc	Charcoal Gray
07 62 00	Sheet Metal Flashing and Trim				
		SM-1		All Coping and Flashing	Match MWP-1
08 22 10	Fiberglass Reinforced Door and Frame System				
		FRP			Match P-2
09 65 13	Resilient Base & Accessories				
	Rubber Base	RB-1	Tarkett	4” Rubber Base w/toe at hard surface flooring; w/out toe at carpet	Burnt Umber 63
09 91 23	Painting				
		P-1	Sherwin Williams	Interior Paint	Passive, SW 7064
		P-2	Benjamin Moore	Doors and Frames	Grizzle Gray, SW 7068

END OF FINISH LEGEND 09 00 01

Spec. Section	Item	Keyword	Manufacturer	Description	Color/Finish

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SECTION 092900 - GYPSUM BOARD AND ACCESSORIES

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. Interior gypsum board.
2. Tile backing panels.

B. Related Requirements:

1. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

C. Samples for Verification: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum.
b. CertainTeed Corporation.
c. Continental Building Products, LLC.
d. Georgia-Pacific Building Products.
e. National Gypsum Company.
f. PABCO Gypsum.
g. Temple-Inland Building Products by Georgia-Pacific.
h. United States Gypsum Company.

2. Thickness: 5/8 inch (15.9 mm).
3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

B. Impact-Resistant Gypsum Board: ASTM C1396/C1396M gypsum board, tested according to ASTM C1629/C1629M.

1. Location: Locker Room Ceilings
2. Core: 5/8 inch (15.9 mm), Type X.
3. Surface Abrasion: ASTM C1629/C1629M, meets or exceeds Level 2 requirements.
4. Indentation: ASTM C1629/C1629M, meets or exceeds Level 3 requirements.

5. Soft-Body Impact: ASTM C1629/C1629M, meets or exceeds Level 3 requirements.
6. Hard-Body Impact: ASTM C1629/C1629M, meets or exceeds Level 3 requirements according to test in Annex A1.
7. Long Edges: Tapered.
8. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, in maximum lengths available to minimize end-to-end butt joints.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. C-Cure.
    b. CertainTeed Corporation.
    c. Custom Building Products.
    d. FinPan, Inc.
    e. James Hardie Building Products, Inc.
    f. National Gypsum Company.
    g. United States Gypsum Company.
    h. Georgia-Pacific Building Products.

2. Thickness: 5/8 inch (15.9 mm).
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:

    a. Cornerbead.
    b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    c. L-Bead: L-shaped; exposed long flange receives joint compound.
    d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    e. Expansion (control) joint.

3. Ceiling Trim and Transitions: Refer to Section 09 51 13.

    a. Fry Reglet ½” Reveal Molding DRM 50-50.
    b. Fry Reglet “Snap-In” Reveal (1/2”) DRM-SNAP-IN-50.
    c. Fry Reglet “Z” Reveal (1/2”) DRMZ50-50.
    d. Fry Reglet “J” Molding (1/2”) JDM-50.
    e. Fry Reglet “F” Reveal Molding (1/2”) DRMF-50-50.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Sealant: 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. See Section 07 92 00.

F. Thermal Insulation: As specified in Section 07 21 00.

G. Vapor Retarder: As specified in Section 07 26 00.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: Vertical surfaces unless otherwise indicated.
2. Type X: Vertical surfaces unless otherwise indicated.
3. Ceiling Type: Type X.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    b. At high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.

D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 APPLYING TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile.

B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings, according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners unless otherwise indicated.
2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.
4. U-Bead: Use at exposed panel edges where indicated.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
3. Level 3: Where indicated.
4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

    a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 099123 - PAINTING

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 surface preparation, painting and finishing of exposed interior and exterior items and surfaces as defined in the Master Painters Institute (MPI) Architectural Painting Manual and the following:

1. Surface preparation, priming and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
2. Special Preparation and repainting of existing surfaces.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 7 Section "Sealants" for caulking of interior joints at or adjacent to surfaces to be painted.
2. Division 5 Section, "Metal Fabrications" for shop-priming ferrous metal.
3. Division 8 Section, "Hollow Metal Door and Frames" for shop-priming steel doors and frames.

C. Paint exposed surfaces whether or not colors are designed in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

1. Painting includes field-painting exposed bare and covered pipes and ducts, hangers, exposed steel and iron work and primed metal surfaces of mechanical and electrical equipment.
2. In general, conduit, ducts, piping and like material exposed in a room or area scheduled to be painted shall be painted, same color as the adjacent surface unless otherwise indicated.

D. Painting is not required on prefinished items (except as noted), finished metal surfaces, concealed surfaces, operating parts and labels.

1. Prefinished items not to be painted include the following factory-finished components:

a. Acoustic materials.
b. Plastic laminated architectural casework.
c. Finished mechanical and electrical equipment.
d. Light fixtures.

e. Switchgear.
f. Distribution cabinets.
g. Prefinished toilet compartments.

2. Concealed surfaces not to be painted include wall or ceiling surfaces in inaccessible areas.
3. Finished metal surfaces not to be painted include:

a. Anodized aluminum
b. Stainless steel and Chromium plate.
c. Copper, bronze and brass

4. Operating parts not to be painted include moving parts of operating equipment such as the following:

a. Valve and damper operators
b. Linkages
c. Sensing devices
d. Motor and fan shafts

5. Labels: Do not paint over Underwriters Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating or nomenclature plates.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each paint system specified, including block fillers and primers.

1. Provide the manufacturer's technical information including label analysis and instructions for handling, storage and application of each material proposed for use.
2. List each material and cross-reference the specific coating, finish system and application. Identify each material by the manufacturer's catalog number and general classification.
3. Submit Material Safety Data Sheets to Owner's Representative at least two weeks before material is delivered to the site.

C. Samples for Verification Purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions on representative samples of the actual substrate.

1. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color and texture are achieved.
2. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
3. Submit samples on the following substrates for the Architect's review of color and texture only.

a. Gypsum Board: Submit two 8-inch-square samples for each color and finish.

b. Painted Wood: Submit two 12-inch square samples of each color and material on hardboard.
c. Ferrous Metal: Submit two 4-inch-square samples of flat metal and two 8-inch-long samples of solid metal for each color and finish.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.

B. Single-Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

C. Coordination of Work: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

D. Paint Grade: 'Premium' as defined by the MPI.

E. Employ only qualified journeymen in this painting and decorating work; apprentices may be employed on the project to work under the direction of qualified journeymen.

F. Conform to the standards contained in the Master Painters Institute Architectural Painting Specification Manual, latest edition (hereafter referred to as MPI Painting Specification Manual) for all painting products including preparation and application of materials. MPI Painting Specification Manual as issued by the local MPI Accredited Quality assurance Association having jurisdiction.

G. All paint manufacturers and products used shall be as listed under the "Approved Products" section of the MPI Architectural Painting Specification Manual.

1.5 BENCHMARK SAMPLES (MOCK-UPS)

A. Provide a full-coat benchmark finish sample for each interior and exterior coating and color required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.

1. Architect will select one surface to represent surfaces and conditions for application of each type of coating and color.

a. Wall Surfaces: Provide samples on at least 100 sq. ft. of each new and existing wall.

2. Apply benchmark samples, according to requirements for the completed Work. Provide required sheen, color, and texture on each surface.

a. After finishes are accepted, Architect will use the surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job site in the manufacturer's original, unopened packaged and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type)
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing and application.

1.7 JOB CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperature are between 45 deg F (7 deg C) and 95 deg F (35 deg C).

C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

D. Do not proceed with any work under this Section unless a lighting level of a minimum of 15 candlepower per square foot is provided on the surfaces to be finished.

1.8 EXTRA STOCK

A. For the Owner's maintenance purposes for touch up, furnish one properly filled, labeled and sealed gallon can of each type of finish coat of each color taken from the batch mix furnished for the work. Turn over to the Owner's representative at completion of the painting work. Obtain receipt to include in close-out documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. All materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) shall be in accordance with the MPI Architectural Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used.

B. Other paint materials such as linseed oil, shellac, etc. shall be the highest quality product of an approved manufacturer listed in the MPI Architectural Painting Specification Manual and shall be compatible with other coating materials as required.

C. All materials and paints shall be lead and mercury free and shall have low VOC content where possible.

D. Manufacturer: Provide products according to the manufacturer and product identification listed in the Finishes Legend. Subject to conformance with requirements and properties of the products listed, products of the following manufacturers will be considered.

1. Benjamin Moore & Co. (Moore)
2. Columbia Paint Co. (Columbia)
3. Fuller (Fuller)
4. Glidden Professional (Akzonobel).
5. Parker Paint Mfg. Company (Parker)
6. PPG Industries, Pittsburgh Paints (PPG)
7. Rodda Paint Co. (Rodda)
8. The Sherwin-Williams Company (S-W)
9. ICI Paint.

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, finish coat materials and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.

B. Material Quality: Provide the manufacturer's product as specified. Paint material containers not displaying manufacturer's product identification shall not be brought to the job site.

C. Paints shall comply with Green Seal Standard GS-11 points.

D. Chemical Components of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or finishing shop:

1. Flat Paints and Coatings: VOC not more than 50 g/L.
2. Non-Flat Paints and Coatings: VOC not more than 150 g/L.
3. Anti-Corrosive Coatings: VOC not more than 250 g/L.
4. Varnishes and Sanding Sealers: VOC not more than 350 g/L.
5. Stains: VOC not more than 250 g/L.
6. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
7. Restricted Components: Paints and coatings shall not contain any of the following:

    a. Acrolein.
    b. Acrylonitrile.
    c. Antimony.
    d. Benzene.
    e. Butyl benzyl phthalate.
    f. Cadmium.
    g. Di (2-ethylhexyl) phthalate.
    h. Di-n-butyl phthalate.
    i. Di-n-octyl phthalate.
    j. 1, 2-dicholorbenzene.
    k. Diethyl phthalate.
    l. Dimethyl phthalate.
    m. Ethylbenzene.
    n. Formaldehyde.

2.3 COLOR SCHEDULE

A. Where colors are identified by product names and numbers, provide perfect color match to the listed colors. "P" numbers refer to color identification in the Finishes Legend included in the Finish Schedule at the end of this Section.

2.4 GLOSS

A. MPI Gloss and Sheet Standards are as follows:	Gloss @ 60°	Sheen @ 85°
1. Gloss Level 1: A traditional matte finish – flat	Max. 5 units	Max. 10 units
2. Gloss Level 2: A high side sheen flat–‘a velvet-like’ finish	Max. 10 units	10 – 35 units
3. Gloss Level 3: A traditional ‘eggshell-like’ finish	10 – 25 units	10 – 35 units
4. Gloss Level 4: A ‘satin-like’ finish	20 – 35 units	Min. 35 units
5. Gloss Level 5: A traditional semi-gloss	35 – 70 units	
6. Gloss Level 6: A traditional gloss	70 – 85 units	
7. Gloss Level 7: A high gloss	More than 85 units	

2.5 PAINT SCHEDULE

A. Exterior Surfaces: Paint exterior surfaces in accordance with the following MPI Architectural Painting Specification Manual requirements:

1. Structural Steel & Metal Fabrications:

a. EXT 5.1N: W. B. Light Industrial Coating (over epoxy primer).

B. Interior Surfaces: Paint interior surfaces in accordance with the following MPI Architectural Painting Specification Manual requirements:

1. Concrete Horizontal Surfaces: Exposed floors.

a. INT.3.2G: Concrete Floor Sealer (water-based).

2. Metal Fabrications: For steel exposed to view.

a. INT 5.1B: High performance acrylic (Gloss Level 5) finish.

3. Galvanized Metal: Doors, frames, miscellaneous steel, pipes, ducts, acoustical deck, etc.

a. INT 5.3B: High performance acrylic (Gloss Level 5) finish.

4. Gypsum Board: Gypsum wallboard, drywall, “sheet rock type material,” etc.

a. INT 9.2B: High performance acrylic (Gloss Level 3, except in Custodial Rooms and Electrical Room where Level 5 is required. Gloss Level 2 at ceilings except for Gloss Level 5 where Gloss Level 5 is required on walls) finish.

5. Gypsum Board at Wet Room Walls: Gypsum wallboard, drywall, “sheet rock type material,” etc.

a. INT 9.2F: Water-Based Epoxy (Gloss Level 5) – Premium Grade.

6. Concrete Masonry Units at Wet Room Walls:

a. INT 9.2F: Water-Based Epoxy (Gloss Level 5) – Premium Grade.

7. Concrete Masonry Units:

a. INT 4.2D: High Performance Architectural Latex; (gloss level 3) finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatment, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
2. Wood: Clean surfaces of dirt, oil and other foreign substances with scrapers, mineral spirits and sandpaper as required. Sand surfaces exposed to view smooth and dust off.

    a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    b. Prime, stain or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood including cabinets, trim, counters, cases, and paneling.
    c. When transparent finish is required, backprime with spar varnish.
    d. Backprime paneling on interior partitions where masonry, plaster or other wet wall construction occurs on backside.
    e. Seal tops, bottoms, and cutouts of primed or unprimed wood doors with a heavy coat of varnish, primer or sealer immediately upon delivery.

3. Ferrous Metals: Clean ungalvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).

    a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.

4. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
5. Cementitious Materials: Prepare concrete, cement plaster and reinforced concrete panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

    a. Use abrasive blast-cleaning methods if recommended by the coating manufacturer.
    b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish coating to blister and burn, correct this condition before coating application. Do not paint surfaces where moisture content exceeds that permitted in the manufacturer's printed directions.

3.3 ADDITIONAL REQUIREMENTS FOR EXISTING SURFACES SCHEDULED FOR REPAINT

A. General: Reference is made to the MPI Architectural Painting Specification Manual for the terminology used to describe the existing conditions. This information is not intended to permit or encourage the Bidder/Contractor to forgo site visits and inspections to determine actual conditions before the Contract is awarded.

3.4 MATERIALS PREPARATION

A. General: Carefully mix and prepare paint materials according to manufacturer's directions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials or residue.
2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
3. Use only thinners approved by the paint manufacturer and only within recommended limits.

B. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.5 APPLICATION

A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

1. Paint surface treatments and finishes are indicated in the schedules.
2. Provide finish coats that are compatible with primers used.

3. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coats has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
5. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles and similar components are in place. Extend coating in these areas, as required, to maintain the system integrity and provide desired protection.
6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
9. Omit primer on metal surfaces that have been shop-primed and touch-up painted.
10. Paint unfinished wood cleats, underside of casework, desk tops and similar items.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

D. Application Procedures: Apply paints and coatings by brush, roller, spray or other applicators according to the manufacturer's directions and requirements of the surface to be painted.

1. Brushes: Use brushes best suited for the material applied.
2. Rollers: Use rollers of carpet, velvet back or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size and recommended by the manufacturer for the material and texture required.

E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of not less than 4.0 mils for the entire system of prime and finish coats for three coat work, or 2.5 mils where two coat work is specified.

F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

G. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks or other surface imperfections.

H. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

3.6 CLEANING

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.7 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing, or replacing and repainting as acceptable to the Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 099123

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SECTION 101423 - PANEL SIGNAGE

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. Panel signs.
2. Room-identification signs.

1.3 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.4 COORDINATION

A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For panel signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
4. Show locations of electrical service connections.
5. Include diagrams for power, signal, and control wiring.

D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Panel Signs: Not less than 12 inches (300 mm) square, including corner.

2. Room-Identification Signs: Full-size Sample.
3. Exposed Accessories: Full-size Sample of each accessory type.

E. Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering.
b. Deterioration of embedded graphic image.
c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL SIGNS, GENERAL

2.2 PERFORMANCE REQUIREMENTS

A. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

B. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

2.3 SIGNS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ACE Sign Systems, Inc.
2. Advance Corporation.
3. Allen Industries Architectural Signage.
4. Allen Markings.
5. APCO Graphics, Inc.
6. ASE, Inc.
7. ASI Sign Systems, Inc.
8. Best Sign Systems, Inc.
9. Bunting Graphics, Inc.
10. Clarke Systems.
11. Cosco.
12. DJO Signs and Graphics.
13. Mountain Dog Signs.
14. InPro Corporation (IPC).
15. L&L Architectural Sign.
16. Mohawk Sign Systems.
17. Nelson-Harkins Industries.
18. Poblocki Sign Company, LLC.
19. Sign Solutions.
20. Signs & Decal Corp.
21. Stamprite Supersine; a division of Stamp Rite Inc.
22. Vomar Products, Inc.

B. Cast-Acrylic Sheet:

1. Color: As indicated in Signage Schedule Section 10 14 19.1 see Signage Schedule.

C. Unframed Panel Signs: Fabricate signs with edges mechanically and smoothly finished to comply with the following requirements:

1. Edge Condition: Edge cut.
2. Corner Condition: Square, unless panel is circular.

D. Laminated Panels: Permanently laminate face panels to backing sheets of material; use manufacturer’s standard process.

E. Graphic Content and Style: Provide sign copy that complies with requirements indicated in the Sign Schedule and on Drawings for size, style, spacing, content, mounting height and location, material, finishes, and colors of signage.

F. Tactile and Braille Copy: Manufacturer's standard process for producing copy complying with ADA Accessibility Guidelines and ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with formed characters with square cut edges free from burrs and cut marks.

1. Panel Material: Clear acrylic sheet with opaque color coating, subsurface applied.
2. Raised-Copy Thickness: Not less than 1/32 inch (0.8mm).

G. Subsurface Copy: Apply maximum 2-mil- (0.10-mm-) thick vinyl or paint copy to back face of clear acrylic sheet forming panel face to produce precisely formed opaque image. Image shall be free from rough edges.

1. Color: As indicated on drawing sheets at the end of this section.

H. Colored Coatings for Acrylic Sheet: For copy and background colors, match vinyl or paint colors indicated, including inks and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are nonfading for application intended.

I. Text Insert: Non-glare acrylic window with 1" insert. Color of Insert: As indicated on Sign Type Sheets at the end of this section.

2.4 PANEL-SIGN MATERIALS

A. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.5 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.
2. For exterior exposure, furnish stainless-steel devices unless otherwise indicated.
3. Sign Mounting Fasteners:

    a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
    b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.

4. Inserts: Furnish inserts to be set by other trades into concrete or masonry work.

B. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch (1.14 mm) thick, with adhesive on both sides.

2.6 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
3. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.

C. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:

1. For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Subsequent changeable inserts are by Owner Furnish two blank inserts for each sign for Owner's use.
2. For frame to hold changeable sign panel, fabricate frame without burrs or constrictions that inhibit function. Furnish initial sign panel. Subsequent changeable sign panels are by Owner.

2.7 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.8 ALUMINUM FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

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 signage work.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Verify that anchor inserts are correctly sized and located to accommodate signs.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Room-Identification Signs and Other Accessible Signage: Install in locations on walls as indicated and according to accessibility standard.

C. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

    a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.

        1) Use this mounting method at all masonry walls with anti-graffiti coating.

    b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

2. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place spacers on studs, place sign in position, and push until spacers are pinched between sign and substrate, embedding the stud ends in holes. Temporarily support sign in position until adhesive fully sets.
b. Thin or Hollow Surfaces: Place spacers on studs, place sign in position with spacers pinched between sign and substrate, and install washers and nuts on stud ends projecting through opposite side of surface, and tighten.

3. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

D. Signs Mounted on Glass: Provide 3M vinyl panel matching sign size and location onto opposite side of glass to conceal back of sign.

1. See Sign Type Sheets for Vinyl color.
2. Use clear VHB tape at panel signs mounted to glass.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423

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Room No.	Agency's Room No.	Room Name	Sign Type	Qty	Location	Color	Copy	Remarks
1ST FLOOR								
110		TOILET ROOM	2	1	Latch side of door 101		RESTROOM	See attached sign type 2 sheet
111		UTILITY CHASE	3	1	Center of door 102		Empolyees Only	See attached sign type 3 sheet
N/A		SITE	1	1	Site/Construction Fence		Construction Site Signage	See attached sign type 1 sheet

General Notes
1. Refer to sheet titled "SIGN MOUNTING LOCATION - SIGN TYPE 6" for typical mounting heights and distance from door frame.
2. Where noted "Exterior Application" in Remarks column, provide weather resistant acrylic panel.

Room No.	Agency's Room No.	Room Name	Sign Type	Qty	Location	Color	Copy	Remarks

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SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

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. Toilet and bath accessories.

B. Related Sections include the following:

1. Plumbing drawings for underlavatory guards.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions and thicknesses, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.

B. Setting Drawings: For cutouts required in other work; include templates, substrate preparation instructions, and directions for preparing cutouts and installing anchoring devices.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use designations indicated in the Toilet and Bath Accessory Schedule and room designations indicated on Drawings in product schedule.

D. Maintenance Data: For accessories to include in maintenance manuals specified in Division 1. Provide lists of replacement parts and service recommendations.

1.4 QUALITY ASSURANCE

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

C. Coordinate location of appropriate backing for surface-mounted accessories, including Owner provided accessories.

1.6 WARRANTY

A. Source Limitations: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise approved by Architect.

B. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

C. Manufacturer's Mirror Warranty: Written warranty, executed by mirror manufacturer agreeing to replace mirrors that develop visible silver spoilage defects within minimum warranty period indicated.

1. Minimum Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide accessories by one of the following:

1. Toilet and Bath Accessories:

a. A & J Washroom Accessories, Inc.
b. American Specialties, Inc.
c. Bobrick Washroom Equipment, Inc.
d. Bradley Corporation.
e. General Accessory Manufacturing Co. (GAMCO).
f. McKinney/Subsidiary Kidde, Inc.

2.2 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.

B. Brass: ASTM B 19, leaded and unleaded flat products; ASTM B 16 (ASTM B 16M), rods, shapes, forgings, and flat products with finished edges; ASTM B 30, castings.

C. Sheet Steel: ASTM A 366/A 366M, cold rolled, commercial quality, 0.0359-inch (0.9-mm) minimum nominal thickness; surface preparation and metal pretreatment as required for applied finish.

D. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180).

E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electrodeposited on base metal.

F. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411.

G. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

H. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

2.3 FABRICATION

A. General: One, maximum 1-1/2-inch- (38-mm-) diameter, unobtrusive stamped manufacturer logo, as approved by Architect, is permitted on exposed face of accessories. On interior surface not exposed to view or back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.

B. Surface-Mounted Toilet Accessories: Unless otherwise indicated, fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.

C. Framed Glass-Mirror Units: Fabricate frames for glass-mirror units to accommodate glass edge protection material. Provide mirror backing and support system that permits rigid, tamper-resistant glass installation and prevents moisture accumulation.

1. Provide galvanized steel backing sheet, not less than 0.034 inch (0.85 mm) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.

D. Mirror-Unit Hangers: Provide mirror-unit mounting system that permits rigid, tamper- and theft-resistant installation, as follows:

1. Heavy-duty wall brackets of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.

E. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

2.4 TOILET AND BATH ACCESSORY SCHEDULE

A. General: Products of a single manufacturer are specified to establish general properties and level of quality for each type of accessory unit required. Products of other listed manufacturers will be acceptable where differences do not detract from function or appearance, as judged by the Architect. Provide all units indicated on drawings as work of this section, except where specified as OFOI.

B. Grab Bars: Provide stainless-steel grab bars complying with the following:

1. Products: Bobrick B6806 Series and B6861 (L-shaped at shower).
2. Stainless-Steel Nominal Thickness: Minimum 0.05 inch (18 gauge).
3. Mounting: Concealed mounting.
4. Gripping Surfaces: Smooth, satin finish.
5. Outside Diameter: 1-1/2 inches for heavy duty applications.

C. Mop and Broom Holder: Provide mop and broom holder complying with the following:

1. Products: Bobrick B-223x36.
2. Holder: 36-inch- long unit fabricated of minimum nominal 1.2-mm- thick, stainless-steel hat channel with four spring-loaded, rubber, cam-type, mop/broom holders.
3. Mounting Height: 54 inches above finished floor, centered over mop sinks.
4. Location: Provide quantity (1) one at each Janitor Room and mop sink.

D. Hooks: Heavy Duty clothes Hook with Concealed Mounting

1. Products: Bobrick B-7671.
2. Secured to wall plate with stainless steel set screw. Withstands 300 lbs. downward pull. Unit projects 1-5/8-inches.

E. Sanitary Napkin Receptacle: Provide stainless-steel sanitary napkin disposal unit complying with the following:

1. Products: Bobrick B-270.
2. Surface-Mounted Type: With seamless exposed walls; self-closing top cover; locking bottom panel with stainless-steel, continuous hinge; and removable, reusable receptacle.

F. Toilet Tissue Dispenser: Provide toilet tissue dispenser complying with the following:

1. Products: Bobrick B-2740.
2. Type: Two-roll dispenser.
3. Description: Cast aluminum, satin finish. Plastic spindles, concealed locking device; theft resistant.
4. No controlled delivery.
5. Capacity: Designed for up to 6-inch-diameter-core tissue rolls.

G. Mirror Unit: Provide mirror unit complying with the following:

1. Product: Bobrick B-290, Sizes 2436.
2. Product: Bobrick B-292 Size 1836
3. Stainless-Steel, Angle-Framed Mirror: Fabricate frame from minimum nominal 0.05-inch- (1.3-mm-) thick stainless-steel angles, with square corners mitered, welded, and ground smooth.
4. Location: See elevations.

H. Metal Shelf:

1. Product: Bobrick B-295 x 18.
2. Description: 18-inch length, satin stainless steel shelf, projects 5 inches (125 mm) from wall, edges are roll formed.

I. Owner Furnished Owner Installed (OFOI):

1. Liquid soap dispensers, wall mounted. One per sink unless shown otherwise.
2. Paper towel dispensers, one at each sink throughout Project.

J. OFOI: Waste Receptacles.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws. Set units level, plumb, and square at locations indicated, according to manufacturer's written instructions for substrate indicated.

C. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

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