NEW TRAINING / BREAKROOM FACILITY
FOR
WASHINGTON COUNTY, VIRGINIA
SOLID WASTE DISPOSAL

14579 INDUSTRIAL PARK ROAD
BRISTOL, VA 24202

SEPTEMBER 29, 2023
(ISSUED MARCH 11, 2024)

PROJECT MANUAL
SPECIFICATIONS AND CONTRACT DOCUMENTS

OWNER:

WASHINGTON COUNTY
1 GOVERNMENT CENTER PLACE, SUITE A
ABINGDON, VIRGINIA 24210

ARCHITECT / ENGINEER:

THE **LANE** GROUP
Architects – Engineers – Planners
Environmental Specialists
310 WEST VALLEY ST NW
ABINGDON, VA 24210
276.206.8571

SET # _____

SEAL SHEET

COMMONWEALTH OF VIRGINIA D. MICHAEL WEAVER LIC. NO. 9031 09-29-2023 ARCHITECT	COMMONWEALTH OF VIRGINIA DERWIN EUGENE CARTMEL Lic. No. 31491 9/29/23 PROFESSIONAL ENGINEER
COMMONWEALTH OF VIRGINIA JOE W. RIGGS Lic. No. 22741 9-29-23 PROFESSIONAL ENGINEER	

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PART VI TECHNICAL SPECIFICATIONS

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GENERAL REQUIREMENTS

WASHINGTON COUNTY, VIRGINIA
ADVERTISEMENT FOR BIDS

For

NEW TRAINING FACILITY FOR
WASHINGTON COUNTY, VA
SOLID WASTE DISPOSAL

Date: March 11, 2024

Time: All time references shall be to Eastern Daylight Time.

SEALED BIDS: Washington County VA is seeking sealed Bids for the construction of a New Training Facility for the Washington County Solid Waste Disposal. The structure is approximately 1,152 square feet in area and is located at 14579 Industrial Park Road, Bristol VA 24202. The Project generally consists of a 1-story wood framed structure constructed on a concrete slab on grade. Exterior walls are split-faced CMU and board & batten cementitious siding. The roofing is standing seam metal. Site development includes underground electrical service, water service, and sanitary sewer. Work also includes grading, entrance drive, and parking. Building systems include a split-system heat pump and electrical.

CLOSING DATE: Tuesday, April 02, 2024, at 2:00 pm. Two (2) hardcopies of the Invitation for Bids shall be delivered to:

County of Washington, Virginia
Attn: Tammy Sturgill, Director, Department of Budget and Finance
Washington County Government Center
1 Government Center Place, Suite A
Abingdon, VA 24210

MANDATORY PRE-BID MEETING: Thursday, March 21, 2024 at 10:00 am in Board of Supervisor's Auditorium, 1 Government Center Place, Suite A, Abingdon, Virginia 24210.

DEADLINE FOR QUESTIONS: March 19, 2024, at 5:00 pm. All questions should be submitted by email no later than seven working days before the due date to mweaver@thelanegroupinc.com . The email inquiry should be identified with a subject line of: "Questions Regarding Construction of a New Training Facility".

The Issuing Office for the Bidding Documents is: **The Lane Group, Inc., 310 Valley Street NW, Abingdon, Virginia 24210, Phone 276-206-8571, email** wrobinson@thelanegroupinc.com. Prospective Bidders may obtain the Bidding Documents at the Issuing Office on **Monday through Thursday between the hours of 7:30am – 5:30pm and Friday between the hours of 8:00am – 12:00pm.** Prospective Bidders may examine copies of the Bidding Documents provided by the Issuing Office at the locations identified below:

Online at:

- County of Washington, Virginia website--https://www.washcova.com/ (download "free of charge")
- eVA-Virginia's eProcurement Marketplace--Virginia Business Opportunities
- Dodge Data & Analytics (subscription required)
- Valley Construction News, 426 W. Campbell Ave., Roanoke, VA 24016 (subscription required)
- AGC of Tennessee/Tri-Cities Branch, 249 Neal Dr., Blountville, TN 37617

Printed copies of the Bidding Documents may be obtained from the Issuing Office, during the hours indicated above. Contractors have the option of receiving a set of Bidding Documents (PDF Format) at no charge, or a hard copy set of Bidding Documents upon payment of $200 (non-refundable) for each set. Checks for Bidding Documents shall be payable to The Lane Group, Inc. Upon request and receipt of the document fee, indicated above, the Issuing Office will transmit the Bidding Documents via delivery service. The date that the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder's date of receipt of the Bidding Documents. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither the County nor Architect will be responsible for full or partial sets of Bidding Documents, including Addenda, if any, obtained from sources other than the Issuing Office and the County.

By submitting a bid in response to this Solicitation, Contractor agrees to the following terms and conditions that shall apply to this procurement.

A. Submittal of bid

Two copies of the completed bid form and references may be submitted by regular mail delivery (U.S. or private delivery service) or hand-delivered to **Tammy Sturgill, Director**; **Department of Budget and Finance, Washington County Government Center Building, 1 Government Center Place, Suite A; Abingdon, Virginia 24210**. The County shall not accept bids by email transmittal. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed to the County at the above address.

B. Deadline for County receipt

Bids must be received by the County no later than: **2:00 p.m. April 2, 2024**. Bids received after the deadline, postmark notwithstanding, shall be rejected.

C. Form of bid

a. Bid must be made using the form provided with this Solicitation.
b. Bid must include references using the form provided with this Solicitation.
c. Bid must be submitted in an envelope that is clearly marked: "Bid for Construction of New Training Facility" and shall bear on the outside the Bidder's name, address, and license number.
d. Bid must be signed in ink by an official authorized to bind the Contractor.
e. Bid must contain the following on the outside of the envelope containing the Bid: If a contract is for one hundred twenty thousand dollars ($120,000) or more, or if the total value of all construction, removal, repair, or improvements undertaken by the bidder within any twelve-month period is seven hundred fifty thousand dollars ($750,000) or more, the bidder is required under Title 54.1, Chapter 11, Code of Virginia (1950) as amended, to show evidence of being licensed as a "Class A Contractor." The bidder shall place on the outside of the envelope containing the Bid, and shall place in the Bid over his signature, the following notation:

   "Licensed Class A Virginia Contractor No. _____."

D. Bid Bond or Guarantee

Each bid shall be accompanied by surety in the form of a bid bond or letter of credit in the amount of five percent of the amount of the bid, which shall be made payable to the Treasurer of Washington County. The surety provider must be legally authorized by the Virginia State Corporation Commission to do business in the Commonwealth of Virginia. Such bid surety shall be submitted with the understanding that it shall guarantee that the bidder will not withdraw such bid during the period of 30 days following the opening of bids; that if such bid is accepted, the bidder will accept and perform under the terms of the Invitation for Bids and purchase order or contract. The bid surety will be returned upon award of contract.

E. Rejection if bid in improper form

Contractor's failure to submit a bid on the bid form provided with this Solicitation and with all information required by this Solicitation shall be a cause for rejection of the bid. Modification of or additions to any

portion of the bid form may be cause for rejection of the bid; however, the County reserves the right to decide, on a case by case basis, in its sole discretion, whether to reject such a bid as nonresponsive. As a precondition to its acceptance, the County may, in its sole discretion, request that Contractor withdraw or modify non-responsive portions of a bid that do not affect quality, quantity, price, or delivery.

The County may waive any informalities or minor defects or reject any and all bids. Any Bid may be modified or withdrawn prior to the scheduled time for the opening of bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No Bidder may withdraw a Bid within 30 days after the actual date of the opening thereof except due to an error in accordance with provision "(i)" contained in 11-54(a), Code of Virginia (1950) as amended. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the County and Bidder.

F. Questions and modification

Questions to clarify this Solicitation shall not be received or answered by telephone or in-person. Questions shall be submitted by email no later than five working days before the due date to mweaver@thelanegroupinc.com . The email must identify in the subject line: "Question Regarding New Training Facility for Solid Waste". Please complete the Pre-Bid Question Form provided with the Solicitation and submit to the email indicated. Answers to all questions will be sent by email to all Contractors of whom the County is aware have interest in this Solicitation. There shall be no modification of the Solicitation except by written modification provided by the County. Any written modification will be provided by email to all Contractors of whom the County is aware have interest in this Solicitation.

G. Mandatory pre-bid meeting

A mandatory pre-bid meeting will be held at **10:00 am on Thursday, March 21, 2024**, in the Board of Supervisor's Auditorium, 1 Government Center Place, Suite A, Abingdon, Virginia 24210. The purpose of this meeting is to allow potential bidders an opportunity to present questions and obtain clarification relative to any facet of this solicitation. Due to the importance of all bidders having a clear understanding of the scope of work and requirements of this solicitation, attendance at this meeting is a prerequisite for submitting a bid. Bids will only be accepted from those bidders who are represented at this pre-bid meeting. Attendance will be evidenced by the representative's signature on the sign-in sheet. No one will be admitted after 2:00 pm. Bring a copy of the solicitation with you. Any changes resulting from this meeting will be issued in a written addendum to the solicitation.

H. Inspection of job site and review of contract documents

By submittal of a bid in response to this Solicitation, Contractor certifies that Contractor has inspected the job site and is aware of the conditions under which the work must be accomplished. Claims, as a result of failure to inspect the job site, will not be considered by the County.

Contractor must satisfy themselves of the accuracy of the quantity of the Work by examination of the site and a review of the Contract Documents including Addenda. After bids have been submitted, the Contractor shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done. It is the responsibility of each Contractor before submitting a bid to (a) examine the Contract Documents thoroughly, (b) visit and inspect the site to become familiar with local

conditions and perform additional investigations necessary to satisfy themselves as to surface and subsurface conditions, availability of utilities, and access roads as necessary that may affect the cost, progress, performance, or furnishing of the Work, (c) consider federal, state, and local laws and regulations that may affect cost, progress, performance, or furnishing of the Work, (d) study and carefully correlate Contractor's observations with the Contract Documents, and (e) notify the County of all conflicts, errors, or discrepancies in the Contract Documents. The failure of any Contractor to do any of the foregoing shall in no way relieve any Contractor from any obligation in respect to its Bid.

I. Period allowed for County acceptance of bid

Any bid submitted in accordance with this solicitation shall be valid for 30 days after the bid submittal deadline. At the end of the 30-day period, the bid may be withdrawn at the written request of the Contractor. If the bid is not withdrawn at that time, it remains in effect until an award is made or the solicitation is cancelled.

J. Interview

Prior to making an award pursuant to this solicitation, the County reserves the right to require Contractor to interview with a County review committee to determine whether Contractor is fully qualified to provide the goods and services as set forth herein. The interview is intended to show that Contractor is fully qualified, that Contractor's services will be provided in a completely satisfactory manner, and that Contractor is competent to meet or exceed the performance specifications. Failure by a Contractor to comply promptly with a request for interview may result in its bid being rejected.

K. Award

The contract will be awarded to the lowest responsive and responsible bidder that demonstrates the qualifications as required by this solicitation. The award will be based on the Total Base Bid. The County reserves the right to conduct any tests it may deem advisable and to make all evaluations. The County reserves the right to reject any and all bids in whole or in part, to waive any informality, and to negotiate the bid price as permitted by Virginia Code § 2.2-4318 if the lowest responsive and responsible bid exceeds available funds. Failure of Contractor to execute a contract, provide certificate(s) of insurance, and, if required, file an acceptable performance security within 10 business days of the date of the approval for awarding of the contract as herein provided will be just and sufficient cause for denial of the award.

The Contractor to whom the Contract is awarded will be required to execute the Contract and obtain acceptable performance and payment bonds and certificates of insurance and return four copies of these documents within ten (10) business days from the date when Notice of Award is delivered to the Contractor. The Notice of Award shall be accompanied by the necessary Contract forms. In case of failure of Contractor to execute the Contract, the County may consider the Contractor in default, in which case the Bid Bond accompanying the proposal shall become the property of the County.

The County within twenty (20) days of receipt of an acceptable certificate of insurance, performance and payment bonds, and the Contract signed by the party to whom the Contract was awarded shall sign the Contract and return to such party an executed duplicate of the Contract. Should the County not execute the Contract within this twenty (20) day period, the Contractor may, by written notice, withdraw the signed Contract. Such notice of withdrawal shall be effective upon receipt of the notice by the County. This

withdrawal is the only recourse available to the Contractor when the County fails to execute the contract within this specified time period. The Contractor cannot be reimbursed for any additional costs incurred if he does not, by written notice, withdraw the signed Contract.

The Notice to Proceed shall be issued within ten (10) business days of the execution of the Contract by the County. Should there be reasons why the Notice to Proceed cannot be issued within such period; the time may be extended by mutual agreement between the County and Contractor. If the Notice to Proceed has not been issued within the period mutually agreed upon, the Contractor may terminate the Contract without further liability on the part of either party.

L. Announcement of Decision to Award

Following the announcement of the decision to award a contract as a result of this solicitation, the County will publicly post such notice on the County website at washcova.com on the Board of Supervisors' web page in the meeting agenda public packet.

M. Performance Bond and Payment Bond

A performance security instrument (bond or letter of credit) in the amount of 100 percent of the total bid price for materials and installation may be required of the Contractor prior to providing goods/services. The form of instrument to be provided as surety must be approved by the County. Failure to execute a contract and file an acceptable performance security and certificate of insurance within 10 business days of the date of the approval for awarding of the contract as herein provided, will be just and sufficient cause for the denial of the award. The performance bond will be released upon County's written acceptance after final inspection and determination that the project was completed in compliance with contract specifications.

N. Applicable laws and courts

This solicitation and any resulting contract shall be governed in all respects by the law of the Commonwealth of Virginia, and any litigation with respect thereto shall be brought in the court of appropriate jurisdiction in Washington County, Virginia. The Contractor shall comply with all applicable federal, state and local laws, rules and regulations.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction projects shall apply to the contract throughout.

O. Ethics in public contracting

By submitting their bid, Contractor certifies that their bid is made without collusion or fraud and that they have not offered or received any kickbacks or inducements from any other bidder, supplier, manufacturer, or subcontractor in connection with their bid, and that they have not conferred on any public employee having official responsibility for this procurement transaction any payment, loan, subscription, advance,

deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

P. Debarment status

By submitting their bid, Contractor certifies that they are not currently debarred by the Commonwealth of Virginia or County of Washington, Virginia from submitting a response for the type of goods and/or services covered by this solicitation. Contractor further certifies that they are not debarred from filling any order or accepting any resulting order, or that they are an agent of any person or entity that is currently debarred by the Commonwealth of Virginia or County of Washington, Virginia. If a vendor is created or used for the purpose of circumventing a debarment decision against another vendor, the non-debarred vendor will be debarred for the same time period as the debarred vendor.

Q. Investigation of qualifications of contractor

Contractor agrees to cooperate with such reasonable investigation as the County deems proper and necessary to determine the ability of Contractor to satisfy the terms of any contract that may be awarded pursuant to this Solicitation. Investigation may include inspection of Contractor's physical facilities prior to award to satisfy questions regarding Contractor's capabilities. Further, the County reserves the right to reject any bid if the evidence submitted by, or investigations of, such contractor fails to satisfy the County that such contractor is properly qualified to fulfill the obligations of the contract.

R. Testing and inspection

The County reserves the right to conduct any test/inspection it may deem advisable to assure goods and services conform to the specifications.

S. Equal employment opportunity

The Contractor agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of equal opportunity. Executive Order No. 11246 requires affirmative action and prohibits contractors from discriminating on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin.

T. Direct Purchase

The County reserves the option to enter into "direct purchases" agreements for purchase of all or a portion of tangible personal property necessary for completion of construction projects undertaken for the benefit of the County and thereby save the amount of sales tax thereon by virtue of the County's status as a tax-exempt political subdivision of the Commonwealth, exempt from sales and use taxation pursuant to Virginia Code 58.1-609(4) and -610(B).

PREBID QUESTION FORM

NOTE: This form is to be used for questions regarding the Bid Documents.

Date: _____

Questions Regarding Construction of a Training / Breakroom Facility

The following question concerns Drawing Sheet (number) _____.

_____

_____

_____

_____

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

paragraph _____.

_____

_____

_____

_____

Architect shall respond to all questions. Only questions that alter Bid Documents will be cause for an Addendum.

Email form to: Michael Weaver, Project Manager / Architect

Email Address: **mweaver@thelanegroupinc.com**

Question submitted by: Name_____

Organization_____

END OF PREBID QUESTION FORM

BID SUBMITTAL DOCUMENTS

B I D F O R M

1. Proposal of_____(hereinafter called "BIDDER"), organized and existing under the laws of the State of _____ doing business as a [ ] corporation, [ ] partnership, [ ] individual. Federal Identification Number:_____. VA State Corporation Commission Identification Number:_____.

2. To the **Washington County, Virginia Government** (hereinafter called "OWNER"). In compliance with your Invitation for Bids packet, BIDDER hereby proposes to perform all WORK for the **New Training / Breakroom Facility for Washington County Solid Waste Disposal** project, at 14579 Industrial Park Road, Bristol VA 24202, in strict accordance with the CONTRACT DOCUMENTS at the price or prices stated below.

3. By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

4. **ALL BIDS MUST BE SUBMITTED ON THIS FORM.** Bids will only be accepted where pricing is submitted on this Bid Form. All blank spaces for bid prices must be filled in, in ink or typewriter, and the Bid Form must be fully completed and executed when submitted. The OWNER reserves the right to reject any and all bids.

5. Bidder declares that they have examined the specifications of the materials and services and informed themselves fully in regard to all the conditions pertaining to the materials and services; that they have examined the specifications relative thereto and have read all special provisions furnished prior to the submittal of the Bid; that they have satisfied themselves relative to the materials and services provided.

6. The undersigned BIDDER gives as his/her estimated time for completion **two-hundred-forty (240) consecutive calendar days** and agrees to complete the work within that time after receiving a Notice to Proceed.

7. The BIDDER shall reach Substantial Completion of all work under this contract, as determined by the Architect, within the number of calendar days set forth in the Agreement and Notice to Proceed, as noted above, or otherwise agrees to pay, as liquidated damages, the sum of $200.00 for each consecutive calendar day thereafter until Substantial Completion is met. Final completion shall be reached within 30 calendar days of the Substantial Completion date; otherwise, the Bidder agrees to pay the sum of $100.00 for each consecutive calendar day until Final Completion is met, as determined by the Architect.

8. The bidder has relied upon the following public historical climatological records, for inclusion of expected weather days: NWS Weather Forecast Office for Morristown, Tennessee.

9. BIDDER acknowledges receipt of the following ADDENDA:

_____

10. The undersigned hereby proposes and agrees to furnish all necessary labor materials, equipment, tools, and services for the construction required for this project in accordance with the work write-ups, specifications and other Contract Documents prepared by The Lane Group, Inc., for the following amount:

BASE BID:

LUMP SUM PRICE for ALL demolition and new construction indicated on the Drawings and in accordance with the Project Manual,

_____Dollars ($_____).

Contract award will be based on the **TOTAL BASE BID AMOUNT shown above**.

11. A conditional or qualified Bid will not be accepted.

12. List, describe, and explain any deviations or exceptions to the specifications and requirements for the foregoing Bid: _____
_____
_____

13. BIDDER agrees, if this bid is accepted, to furnish all necessary materials and services in accordance with this bid necessary to complete the Contract in full and complete accordance with the shown, noted, described and reasonably implied requirements of the solicitation attached hereto to the full and entire satisfaction of OWNER, with the definite understanding that no money will be allowed for extra work or extra goods except as set forth in the attached solicitation and any contract that may result from such submitted Bid. The statement on this Bid form shall apply to each element of each bid submitted to the OWNER.

14. In submitting this Bid, it is understood that the right is reserved by the OWNER to reject any and all Bids. If written notice of the acceptance of this Bid is mailed or delivered to the undersigned within thirty (30) days after the opening thereof, or at any time thereafter before this Bid is withdrawn, the undersigned agrees to execute and deliver a Contract in the prescribed form and furnish the required Insurance within ten (10) days after the Contract is presented to him for signature.

15. SUBMITTED BY:

Licensed Class [ ] A [ ] B Virginia Contractor No._____.

Valid until_____.
(Date)

Registration title or specialty description _____

I certify that the firm signing this bid and registered under that name is legally qualified to perform all work included in the scope of the Contract as determined by the Commonwealth of Virginia, Department of Commerce, State Board for Contractors, in granting the registration.

CONTRACTOR

BY TITLE

BUSINESS ADDRESS

References for _____
Name of Bidder

Bidder shall provide a list of at least 3 references where similar goods and/or services have been provided. Each reference shall include the name of the organization, the complete mailing address, name of the contact person, email address and telephone number.

1. ORGANIZATION _____

   ADDRESS _____

   CITY, STATE, ZIP _____

   CONTACT PERSON _____

   TELEPHONE NO. (_____)_____ Email address: _____

2. ORGANIZATION _____

   ADDRESS _____

   CITY, STATE, ZIP _____

   CONTACT PERSON _____

   TELEPHONE NO. (_____)_____ Email address: _____

3. ORGANIZATION _____

   ADDRESS _____

   CITY, STATE, ZIP _____

   CONTACT PERSON _____

   TELEPHONE NO. (_____)_____ Email address: _____

This form is required to be submitted to be considered a Qualified Bidder for this solicitation.

CONDITIONS OF THE CONTRACT

AIA® Document A201® – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)
New Training / Breakroom Facility for
Washington County VA Solid Waste Disposal Facility
14579 Industrial Park Road
Bristol VA 24202

THE OWNER:
(Name, legal status and address)
County of Washington, Virginia
1 Government Center, Suite A
Abingdon, Virginia 24210

THE ARCHITECT:
(Name, legal status and address)
The Lane Group, Inc.
310 Valley Street NW
Abingdon, Virginia 24210

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

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(Topics and numbers in bold are section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

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

§ 1.1.2 THE CONTRACT

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

§ 1.1.3 THE WORK

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

§ 1.1.4 THE PROJECT

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

§ 1.1.5 THE DRAWINGS

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

§ 1.1.6 THE SPECIFICATIONS

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

§ 1.1.7 INSTRUMENTS OF SERVICE

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

§ 1.1.8 INITIAL DECISION MAKER

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

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

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

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

§ 1.3 CAPITALIZATION

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

§ 1.4 INTERPRETATION

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

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

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

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

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

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

ARTICLE 2 OWNER

§ 2.1 GENERAL

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

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

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or

the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

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

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

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

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

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

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

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

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

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

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

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

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

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

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

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

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

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

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

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

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other

facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

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

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

§ 3.5 WARRANTY

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

§ 3.6 TAXES

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

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

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

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

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume

the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

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

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

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

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

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

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

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

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

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

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

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

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

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

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

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be

required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

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

§ 3.14 CUTTING AND PATCHING

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

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

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

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

§ 3.16 ACCESS TO WORK

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

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

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

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

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

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

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

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

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

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

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

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

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

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

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

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

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

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

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

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

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

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

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

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

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

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

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

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

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

§ 5.3 SUBCONTRACTUAL RELATIONS

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

be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

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

- **.1** assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- **.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

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

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

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

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

§ 6.2 MUTUAL RESPONSIBILITY

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

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that

the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

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

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

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

§ 6.3 OWNER'S RIGHT TO CLEAN UP

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

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

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

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

§ 7.2 CHANGE ORDERS

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

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

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

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

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

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

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

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

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

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

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

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

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

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

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

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

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

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

§ 7.4 MINOR CHANGES IN THE WORK

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

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

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

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

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

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

§ 8.2 PROGRESS AND COMPLETION

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

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

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

§ 8.3 DELAYS AND EXTENSIONS OF TIME

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

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

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

§ 9.2 SCHEDULE OF VALUES

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

§ 9.3 APPLICATIONS FOR PAYMENT

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

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

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

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

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

§ 9.4 CERTIFICATES FOR PAYMENT

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

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

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

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

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a separate contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

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

§ 9.6 PROGRESS PAYMENTS

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

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

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

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

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

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

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended

appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

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

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

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

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

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

§ 9.9 PARTIAL OCCUPANCY OR USE

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

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

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

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect

will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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

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

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 10.4 EMERGENCIES

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

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

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

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction

of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE

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

§ 11.3 PROPERTY INSURANCE

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

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

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

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

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

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or

otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

(Paragraphs Deleted)

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

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

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

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

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

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

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in

accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

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

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

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

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

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

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

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

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

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

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

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

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

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

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

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the local courts in Washington County, Virginia.

§ 13.2 SUCCESSORS AND ASSIGNS

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

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

§ 13.3 WRITTEN NOTICE

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

§ 13.4 RIGHTS AND REMEDIES

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

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

§ 13.5 TESTS AND INSPECTIONS

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

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

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

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

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

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

§ 13.6 INTEREST

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

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

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

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency that requires all Work to be stopped;
- **.3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

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

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

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

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

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

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

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

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

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

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

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

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

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

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

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

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

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

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

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

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

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

§ 15.1.2 NOTICE OF CLAIMS

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

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

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

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

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

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

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

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

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

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

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

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

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

§ 15.2 INITIAL DECISION

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

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

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

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

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

(Paragraphs Deleted)

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

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

SUPPLEMENTARY CONDITIONS

The following supplements modify AIA Document A201-2017, General Conditions of the Contract for Construction. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

ARTICLE 2: OWNER

2.3 Information and Services Required of the Owner

Delete Subparagraph 2.3.6 and substitute the following:

> **2.3.6** The Owner shall furnish to the Contractor five (5) copies of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

ARTICLE 3: CONTRACTOR

3.2 Review of Contract Documents and Field Conditions by Contractor

Add the following Paragraph 3.2.5 to Section 3.2:

> **3.2.5** Contractor's requests for information (RFI) shall be prepared on his standard form, numbered sequentially and submitted to the Architect for written interpretation.

ARTICLE 3: CONTRACTOR

3.12 Shop Drawings, Product Data and Samples

Add Paragraph 3.12.11 to Section 3.12.

> **3.12.11** The Architect's review of Contractor's submittals will be limited to examination of an initial submittal and two (2) resubmittals. The Owner is entitled to obtain reimbursement from the Contractor for amounts paid to the Architect for evaluation of additional resubmittals.

ARTICLE 9: PAYMENTS AND COMPLETION

9.2 Schedule of Values

Add Paragraph 9.2.1 to Section 9.2.

> **9.2.1** Contract is Based on a Stipulated Sum.

9.3 Applications for Payment

Add the following Paragraph 9.3.1.3 to Section 9.3.1:

9.3.1.3 Until Substantial Completion, the Owner shall pay ninety-five percent of the amount due the Contractor on account of progress payments.

9.7 Failure of Payment

Add Paragraph 9.7.1 to Section 9.7

9.7.1 County (Owner) shall pay Contractor within 30 days of receipt from Architect of approved Certificate for Payment.

9.8 Substantial Completion

Add the following Paragraph 9.8.3.1 to Section 9.8.3:

9.8.3.1 The Architect will perform no more than two (2) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections.

9.10 Final Completion and Final Payment

Add the following Paragraph 9.10.1.1 to Section 9.10.1:

9.10.1.1 The Architect will perform no more than two (2) inspections to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections.

Add the following Section 9.11 to Article 9:

9.11 Liquidated Damages

9.11.1 The Contractor and the Contractor's surety, if any, shall be liable for, and shall pay, the Owner the sums hereinafter stipulated as liquidated damages, and not as a penalty, for each calendar day of delay after the date established for Substantial Completion in the Contract Documents until the Work is substantially complete: Two-Hundred-Dollars ($200.00). Final completion shall take place within 30 calendar days of the Substantial Completion date, or liquidated damages of One-Hundred-Dollars ($100.00) per consecutive calendar day, from the date set forth by Substantial Completion until Final Completion is met, as determined by the Architect.

ARTICLE 11: INSURANCE AND BONDS

11.2 Owner's Insurance

Delete Section 11.2 and all its subsections.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

Add the following Paragraph 12.2.2.4 to Section 12.2.2:

12.2.2.4 Upon request by the Owner and prior to the expiration of one year from the date of Substantial Completion, the Architect shall conduct and the Contractor shall attend a meeting with the Owner to review the facility operations and performance.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.5. Interest

Add Paragraph 13.5.1 to Section 13.5

13.5.1 Interest, if applicable, shall be paid at a rate of 1.5% per month.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.2 Termination by Owner for Cause

Delete the word "repeatedly" from paragraphs 14.2.1.1 and 14.2.1.3.

END OF SUPPLEMENTARY CONDITIONS

CONTRACT FORMS

AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the Xth. day of April in the year 2024
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

County of Washington, Virginia
1 Government Center Place, Suite A
Abingdon, Virginia 24210

and the Contractor:
(Name, legal status, address and other information)

TBD

for the following Project:
(Name, location and detailed description)

New Training / Breakroom Facility for Washington County VA Solid Waste
14579 Industrial Park Road
Bristol, Virginia 24202

The Architect:
(Name, legal status, address and other information)

The Lane Group, Inc.
310 Valley Street NW
Abingdon, Virginia 24210

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[ ] The date of this Agreement.

[X] A date set forth in a notice to proceed issued by the Owner.

[ ] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

[X] Not later than two hundred forty (240) calendar days from the date of commencement of the Work.

[ ] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be To Be Determined ($ TBD), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
Not Applicable.	

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
Not Applicable.		

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price
Not Applicable.	

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)
Not Applicable.		

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

The Contractor shall substantially complete the work under this Agreement, as determined by the Architect, within Two hundred Forty (240) calendar days set forth in this Agreement and a Notice to Proceed. Liquidated damages will be $200.00 for each calendar day thereafter the substantial completion period until Substantial Completion is met. Final Completion will take place within Thirty (30) calendar days of the Substantial Completion date. Liquidated damages will be $100.00 for each consecutive calendar day until Final Completion is met, as determined by the Architect.

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

Any requests for weather related time extensions to this Agreement must be made within seventy-two (72) hours of the weather event. Once a pay request is submitted, no additional weather-related time extensions will be considered.

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the twenty-fifth day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the twenty-fifth day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than forty-five (45) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- **.1** That portion of the Contract Sum properly allocable to completed Work;
- **.2** That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- **.3** That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- **.4** For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- **.5** Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

The amount of retainage for each progress payment made prior to Substantial Completion shall be five percent (5%).

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

Not Applicable.

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

Not Applicable.

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage.
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- **.1** the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- **.2** a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment.

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

5 % per annum

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[X] Litigation in Washington County Virginia Circuit Court.

[ ] Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

Not Applicable.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS
§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

Mr. Kevin A. Hill, General Services Director
Washington County Virginia Government
1 Government Place
Abingdon, Virginia 24210
(276) 525-1355
khill@washcova.com

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

TBD

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

AIA Document E203, Building Information Modeling and Digital Data Exhibit does not apply to this Agreement.

§ 8.7 Other provisions:

Not Applicable

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction

.5 Drawings

Number	Title	Date
T100	Title Sheet / Drawing Index	September 29, 2023
G101	Project Information	September 29, 2023
Site / Civil		
C101	Site Plan	September 29, 2023
C102	Parking Layout Plan / Site Details	September 29, 2023
Structural		
S101	Foundation Plan	September 29, 2023
S102	Lintel Plan	September 29, 2023
S103	Roof Framing Plan	September 29, 2023
S501	Foundation Details	September 29, 2023
S502	Structural Details	September 29, 2023
S503	Structural Details	September 29, 2023
Architecture		
A101	Floor Plan	September 29, 2023

A111	Attic Floor Plan Reflected Ceiling Plan	September 29, 2023
A121	Roof Plan	September 29, 2023
A201	Elevations	September 29, 2023
A301	Building Section	September 29, 2023
A302	Wall Section	September 29, 2023
A601 A602	Door and Window Schedules and Door Elevations	September 29, 2023
A701	Finish Schedule, Enlarged Plans, Accessories Schedule	September 29, 2023
MPE Specifications		
MPE 101	Mechanical, Plumbing, & Electrical Specifications	September 29, 2023
MPE 102	Mechanical, Plumbing, & Electrical Specifications	September 29, 2023
Plumbing		
P101	Plumbing Floor Plan	September 29, 2023
P201	Plumbing Schedule & Details	September 29, 2023
Mechanical		
M101	Mechanical Floor Plan	September 29, 2023
Electrical		
E101	Electrical Floor Plans	September 29, 2023

.6 Specifications

Section	Title	Date	Pages
010100	Summary of Work	June 30, 2023	
101400	Procedures and Quality Control	June 30, 2023	
012500	Contract Modification Procedures	June 30, 2023	
012900	Payment Procedures	June 30, 2023	
013000	Submittals		
014000	Quality Requirements	June 30, 2023	
015000	Temporary Facilities	June 30, 2023	
016000	Product Requirements	June 30, 2023	
017000	Execution Requirements	June 30, 2023	
017700	Closeout Procedures	June 30, 2023	
017810	Project Record Documents	June 30, 2023	
017820	Operation and	June 30, 2023	

	Maintenance Data	
024119	Selective Demolition	June 30, 2023
032000	Concrete Reinforcing	June 30, 2023
033000	Cast-in-Place Concrete	June 30, 2023
042000	Concrete Unit Masonry	June 30, 2023
055000	Miscellaneous Metal	June 30, 2023
061000	Rough Carpentry	June 30, 2023
061600	Sheathing	June 30, 2023
061920	Prefabricated Wood Trusses	June 30, 2023
062000	Exterior Finish Carpentry	June 30, 2023
064000	Plastic-Laminate-Faced Architectural Cabinets	June 30, 2023
066400	Plastic Paneling	June 30, 2023
072000	Building Insulation	June 30, 2023
	Foamed-in-Place	June 30, 2023
072140	Masonry Wall Insulation	
074113	Metal Roof Panels	June 30, 2023
074293	Metal Soffit Panels	June 30, 2023
075323	EPDM Roofing Membrane	June 30, 2023
076200	Sheet Metal Flashing and Trim	June 30, 2023
079000	Joint Sealants	June 30, 2023
081000	Hollow Metal Doors and Frames	June 30, 2023
083110	Access Doors and Frames	June 30, 2023
087000	Door Hardware	June 30, 2023
088000	Glazing	June 30, 2023
092900	Gypsum Board	June 30, 2023
093000	Vinyl Composition Tile	June 30, 2023
096723	Resinous Flooring	June 30, 2023
099600	Industrial Protective and Marine Coatings	June 30, 2023
104000	Fire Protection Specialties	June 30, 2023
104400	Specialty Signs	June 30, 2023
105723	Wire Shelving	June 30, 2023
108000	Toilet and Bath Accessories	June 30, 2023
123661	Solid Surfacing Countertops	June 30, 2023
312300	Earthwork for Structures	June 30, 2023
312500	Erosion and Sediment Control	June 30, 2023
312600	Excavation and	June 30, 2023
	Backfilling for Utilities	June 30, 2023
321000	Roadway and Parking Lots	June 30, 2023
321723	Pavement Markings	June 30, 2023
321813	Dog Specific Synthetic Grass Outdoor Surfacing	June 30, 2023
323113	Chain Link Fences and Gates	June 30, 2023
331000	Water Utilities	June 30, 2023
333000	Sanitary Sewerage Utilities	June 30, 2023

334000	Storm Drainage Utilities	June 30, 2023

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

Title	Date	Pages

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
Jason Berry, County Administrator	
(Printed name and title)	*(Printed name and title)*

AIA® Document A101® – 2017 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the TBD day of April in the year 2024
(In words, indicate day, month and year.)

for the following **PROJECT**:
(Name and location or address)

New Training / Breakroom Facility for Washington County VA Solid Waste Disposal Facility
14579 Industrial Park Road
Bristol, VA 24202

THE OWNER:
(Name, legal status and address)

County of Washington, Virginia
1 Government Center Place, Suite A
Abingdon, VA 24210

THE CONTRACTOR:
(Name, legal status and address)

TBD

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

This document is intended to be used in conjunction with AIA Document A201®–2017, General Conditions of the Contract for Construction. Article 11 of A201®–2017 contains additional insurance provisions.

TABLE OF ARTICLES

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

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

§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

(Paragraphs deleted)
(Table deleted)
(Paragraphs deleted)
(Table deleted)
(Paragraphs deleted)

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

(Paragraphs deleted)

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

A3.1.1.1 Certificates of Insurance shall indicate the Certificate Holder as:
County of Washington, Virginia
1 Government Center Place, Suite A
Abington, Virginia 24210

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04. All required insurance shall be provided by companies that have a current A. M. Best insurance rating of A- or better and are licensed or approved to do business in the Commonwealth of Virginia.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than one million dollars ($ 1,000,000) each occurrence, two million dollars ($ 2,000,000) general aggregate, and two million dollars ($ 2,000,000) aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
- .4 bodily injury or property damage arising out of completed operations; and
- .5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.
- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement, where the Work involves such hazards.
- .11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than one million dollars ($ 1,000,000) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than five hundred thousand dollars ($ 500,000) each accident, five hundred thousand dollars ($ 500,000) each employee, and five hundred thousand dollars ($ 500,000) policy limit.

(Paragraphs deleted)

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[X] **§ A.3.3.2.1** Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:

(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

[ ] **§ A.3.3.2.3 Asbestos Abatement Liability Insurance**, with policy limits of not less than one million dollars ($ 1,000,000) per claim and two million dollars ($ 2,000,000) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[X] **§ A.3.3.2.2** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[X] **§ A.3.3.2.3** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

(Paragraphs deleted)

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	Equal to 100% of Contract Sum.
Performance Bond	Equal to 100% of Contract Sum.

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

(Paragraphs deleted)

NOTICE OF AWARD

To:

Project Description: **NEW TRAINING / BREAKROOM FACILITY FOR WASHINGTON COUNTY VA – SOLID WASTE DISPOSAL Bristol, Virginia**

The OWNER has considered the BID you submitted, for the project described above, in response to its Advertisement for Bids and Instruction to Bidders.

You are hereby notified that your BID has been accepted for the work in the amount of **$_____.**

You are required by the Instructions to Bidders to execute the Agreement and furnish the required Contractor's Performance BOND, Payment BOND, and Certificates of Insurance within ten (10) calendar days from the date of this Notice of Award.

If you fail to execute the Agreement and to furnish Bonds and Insurance within ten (10) days from the date of this Notice, the Owner will be entitled to consider all your rights arising from the Owner's acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the Owner.

Dated this _____ day of _____**,** 2024.

Washington County Virginia Government

By _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by

(Name of Contractor)

this the _____ day of _____, 2024

By _____

Title _____

NOTICE TO PROCEED

To:

Date:

Project: **NEW TRAINING / BREAKROOM FACILITY FOR WASHINGTON COUNTY VA – SOLID WASTE DISPOSAL**
Bristol, Virginia

You are hereby notified to commence WORK in accordance with the Agreement dated __/__, 2024, on or before __/__, 2024, and you are to complete the WORK within 240 consecutive calendar days thereafter. The date of completion of all WORK is, therefore, __/__, 2024.

Washington County Virginia Government

By _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by

(Name of Contractor)

this the _____ day of _____, 2024.

By _____

Title _____

AIA® Document G701® – 2017

Change Order

PROJECT: *(Name and address)*
New Training / Breakroom Facility for Washington County VA Solid Waste Disposal Facility
14579 Industrial Park Road
Bristol VA 24202

CONTRACT INFORMATION:
Contract For: General Construction

Date: TBD

CHANGE ORDER INFORMATION:
Change Order Number: 001

Date: February 26, 2024

OWNER: *(Name and address)*
County of Washington, Virginia
1 Government Center, Suite A
Abingdon, Virginia 24210

ARCHITECT: *(Name and address)*
The Lane Group, Inc.
310 Valley Street NW
Abingdon, Virginia 24210

CONTRACTOR: *(Name and address)*
TBD

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)
Relocate existing generator from project site to Green Cove, Virginia.

The original Contract Sum was	$	0.00
The net change by previously authorized Change Orders	$	0.00
The Contract Sum prior to this Change Order was	$	0.00
The Contract Sum will be increased by this Change Order in the amount of	$	0.00
The new Contract Sum including this Change Order will be	$	0.00

The Contract Time will be increased by Zero (0) days.
The new date of Substantial Completion will be is to be determined.

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

The Lane Group, Inc.	TBD	County of Washington, Virginia
ARCHITECT *(Firm name)*	**CONTRACTOR** *(Firm name)*	**OWNER** *(Firm name)*
SIGNATURE	**SIGNATURE**	**SIGNATURE**
Michael Weaver, Project Manager		Jason Berry, County Administrator
PRINTED NAME AND TITLE	**PRINTED NAME AND TITLE**	**PRINTED NAME AND TITLE**
DATE	**DATE**	**DATE**

AIA® Document G702® – 1992

Application and Certificate for Payment

TO OWNER: Washington County VA Government
1 Government Place
Abingdon, Virginia 24210

PROJECT: New Training / Breakroom Facillity for Washington County VA Solid Waste Disposal Facility
14579 Industrial Park Road
Bristol VA 24202

APPLICATION NO: 01
PERIOD TO:

Distribution to:
OWNER: ☒
ARCHITECT: ☒
CONTRACTOR: ☒
FIELD: ☐
OTHER: ☐

FROM CONTRACTOR: TBD

VIA ARCHITECT: The Lane Group, Inc.
310 V alley Street NW
Abingdon, VA 24210

CONTRACT FOR: General Construction
CONTRACT DATE:
PROJECT NOS: 22135 / /

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703®, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM		$0.00
2. NET CHANGE BY CHANGE ORDERS		$0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2)		$0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)		$0.00
5. RETAINAGE:		
a. 0 % of Completed Work (Column D + E on G703)	$0.00	
b. 0 % of Stored Material (Column F on G703)	$0.00	
Total Retainage (Lines 5a + 5b or Total in Column I of G703)		$0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)		$0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)		$0.00
8. CURRENT PAYMENT DUE		$0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	$0.00	

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$0.00	$0.00
Total approved this Month	$0.00	$0.00
TOTALS	$0.00	$0.00
NET CHANGES by Change Order		$0.00

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED $0.00

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

(3B9ADA53)

AIA® Document G703® – 1992

Continuation Sheet

AIA Document G702®, Application and Certification for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO: 001
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO: 22135

A	B	C	D	E	F	G		H	I
			WORK COMPLETED						
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D + E + F)	% (G÷C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
	GRAND TOTAL	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**0.00%**	**$0.00**	**$0.00**

User Notes:

GENERAL REQUIREMENTS

SECTION 010100 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS - Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 PROJECT DESCRIPTION

A. The Project generally consists of a 1-story wood framed structure constructed on a concrete slab on grade. Exterior walls are split-faced CMU and board & batten cementitious siding. The roofing is standing seam metal. Site development includes underground electrical service, water service, and sanitary sewer. Work also includes grading, entrance drive, and parking. Building systems include a split-system heat pump and electrical.

B. The Work includes, but is not limited to, the provisions of all sitework, architectural, structural, plumbing, mechanical, electrical, and other work as indicated on the drawings and as specified herein.

C. Contract Documents dated September 29, 2023 were prepared for the Project by The Lane Group, Inc., 310 Valley Street NW, Abingdon, Virginia 24210.

D. The Work will be constructed under a single prime contract.

1.3 OTHER CONTRACTS - In accordance with the General Conditions, the Owner has the right to issue other contracts for work on this site or within the existing building. The Contractor shall cooperate and coordinate his / her work with the work of these separate contractors as instructed by the Owner.

1.4 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have limited use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited only by the Owner's right to perform work.

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

1. Driveways and Entrances: Keep driveways and entrances clear and available to public visitors, shelter staff, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
2. Existing facilities and structures on site will remain occupied and in use during construction. The Contractor shall maintain access to existing facilities and minimize disruption to users to the greatest extent possible.

3. Construct safety barricades and safety signage in order to protect the public from harm during the construction of the project.
4. Coordinate with staff regarding work that will impact access to the property, interrupt utilities, or operations.
5. Protect all existing natural areas, existing vegetation, existing roads, existing utilities, and all other existing items from harm during construction activities. Confine disturbance to existing items to the work that is indicated on the drawings and in the specifications.
6. Coordinate with shelter staff regarding access to the site, including staging areas, and storage areas for materials and equipment. Provide means for securing building materials and equipment during the construction period to prevent damage or theft.

C. Use of Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building during the construction period.

1.5 OCCUPANCY REQUIREMENTS

A. The Owner will not occupy the building during the construction period.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 010100

SECTION 010400 - PROCEDURES AND QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS - Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 GUARANTEE - WARRANTY

A. Deliver guarantees and warranties from subcontractors and suppliers to the Architect before final payment.

B. Guarantees and warranties from subcontractors and suppliers do not relieve the Contractor of responsibility as set forth in the Contract Documents.

C. The Contractor warrants, by acceptance of final payment, that work performed and materials used for this work are as specified or as authorized by Change Orders. The Contractor further warrants that items or workmanship not covered by specific requirements as mentioned by name are of good quality, comparable to similar work as specified.

1.3 EXISTING UTILITIES

A. The Contractor shall make all necessary investigations to determine the existence and location of utilities prior to commencement of work to verify any conflicts. Where conflicts are probable the Contractor shall notify the Architect/Engineer in writing requesting proper action to be taken. The Contractor will be held responsible for any damage to and for maintaining and protecting existing utilities and structures, both public and private ownership. However, if it is determined that such existing utility lines or structures require relocation or reconstruction or any other work beyond normal protection and are not shown in the Contract Documents to be relocated, then the Owner will address either by Change Order or separate independent contract. The General Contractor shall assume responsibility for coordinating the relocation with the respective utility companies; this expense will be borne by the Contractor.

1.4 SAFETY CODES

A. The rules and regulations governing construction, demolition and all excavation under the Occupational Safety and Health Act shall be adhered to and made a part of these specifications.

1.5 DRAWINGS AND SPECIFICATIONS

A. The Contractor will be furnished, free of charge, five (5) copies of the Drawings and Specifications, and will be furnished at the cost listed in the Advertisement for Bids, as many additional copies as he may require.

1.6 PERMITS, LICENSES, TAXES, INSPECTION CERTIFICATES & AIDS TO CONSTRUCTION

A. The General Contractor will be responsible for obtaining and paying for all permits, bonds, licenses, inspection fees, taxes, connection fees and aids to construction other than those listed below:

1. Local building permit(s) costs. The General Contractor will be responsible for obtaining all required permits, but the costs thereof will be waived by the municipality.

1.7 PRECONSTRUCTION CONFERENCE

A. Either before or soon after actual award of the Contract (but in any event, prior to the start of construction), the Contractor or his representative(s) shall conduct a Preconstruction Conference with representatives from the Owner and Architect / Engineer. The conference will serve to acquaint the participants with the general plan of contract administration and requirements under which the construction operation is to proceed and will inform the Contractor in detail of his obligations and those of his subcontractors under this Contract. The date, time and place of the conference shall be furnished to the Owner and Contractor by the Architect / Engineer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 010400

SECTION 012500 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on Architect's standard Supplemental Instruction form.

1.3 PROPOSAL REQUESTS

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

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

1.4 CHANGE ORDER PROCEDURES

A. Change Order (CO): On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on their office standard CO form.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive (CCD): Architect may issue a Construction Change Directive on their office standard CCD form. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

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

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

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Submittals Schedule and Application for Payment forms with Continuation Sheets.
2. Submit a copy of the Schedule of Values with the Construction Schedule no later than five working days before the date schedule for submittal of initial Application of Payment.

B. Format and Content: Use the Project Manual Table of Contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of the Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value.

1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project

Manual Table of Contents. Provide several line items for principal subcontract amounts, where appropriate.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

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

    1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
    2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

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

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

F. Waivers of Mechanic's Lien: If requested, each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

    a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

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

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Submittals Schedule (preliminary if not final).
5. List of Contractor's staff assignments.
6. Copies of building permits.
7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
8. Certificates of insurance and insurance policies.
9. Performance and payment bonds.
10. Data needed to acquire Owner's insurance.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."

7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013000 – SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS - The General Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 NUMBER OF SUBMITTALS - One (1) for Architect, one (1) for Owner, two (2) for O&M Manuals, and (2) additional sets for Contractor, minimum six (6) sets total. Submittals of less than six (6) sets will be returned without review. Submittals will be reviewed only if approved by General Contractor with his stamp.

A. Submittals may be made as electronic files in .pdf format by email subject to the same submittal requirements and criteria.

PART 2 - DESCRIPTION OF REQUIREMENTS

2.1 SUBMITTALS - Submittals controlled by these general requirements shall include shop drawings, product data, samples and miscellaneous work-related submittals. The individual submittal requirements are specified in applicable sections for each unit of work.

2.2 DEFINITIONS - The work-related submittals of this Section, in addition to the definitions of the General Conditions and elsewhere in the Contract Documents, are further categorized for convenience as follows:

A. Shop drawings include specially-prepared technical data of all forms including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for application to more than one project.

B. Product data include standard printed information on materials, products and systems; not specially-prepared for this project, other than the designation of selections from among available choices printed therein.

C. Samples include both fabricated and unfabricated physical examples of materials, products and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.

D. Mock-ups are a special form of samples, which are too large or otherwise inconvenient for handling in the specified manner for transmittal of sample submittals.

E. Miscellaneous submittals related directly to the work include warranties, maintenance agreements, workmanship bonds, survey data and reports, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record

drawings, field measurement data, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the work and not processed as shop drawings, product data or samples.

PART 3 - GENERAL SUBMITTAL REQUIREMENTS

3.1 SCHEDULING - Where appropriate in various required administrative submittals (listings of products, manufacturers, suppliers and subcontractors, and in job progress schedule), show principal work-related submittal requirements and time schedules for coordination and integration of submittal activity with related work in each instance.

3.2 COORDINATION AND SEQUENCING - Coordinate preparation and processing of submittals with performance of the work so that work will not be delayed by submittals. Coordinate and sequence different categories of submittals for the same work, and for interfacing units of work, so that one will not be delayed for coordination with another. No extension of time will be allowed because of failure to properly coordinate and sequence submittals.

3.3 PREPARATION OF SUBMITTALS - Provide permanent marking on each submittal to identify project, date, Contractor, subcontractor, submittal name and similar information to distinguish it from other submittals. Show Contractor's executed review and approval marking and provide space for Architect's/Engineer's "Action" marking. Package each submittal appropriately for transmittal and handling. Submittals which are received from sources other than through Contractor's office will be returned "without action".

PART 4 - SPECIFIC CATEGORY SUBMITTAL REQUIREMENTS

4.1 GENERAL - Except as otherwise indicated in individual work sections, comply with general requirements specified herein for each indicated category of submittal. Provide and process intermediate submittals (where required between initial and final) similar to initial submittals.

4.2 SHOP DRAWINGS - Provide newly-prepared information, with graphic information at accurate scale (except as otherwise indicated), with name of preparer indicated (firm name). Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate measurement. Indicate compliance with standards, and special coordination requirements. Do not allow shop drawing copies without appropriate final "Action" markings by Architect/Engineer to be used in connection with the work.

4.3 PRODUCT DATA - Collect required data into one submittal for each unit of work or system; and mark each copy to show which choices and options are applicable to project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one set of product data (for each submittal) at project site, available for reference by Architect/Engineer or others. Submittals shall be the same as for Shop Drawings.

4.4 SAMPLES - Provide units identical with final condition of proposed materials or products for the work. Include "range" samples (not less than three (3) units) where unavoidable variations must be expected and describe or identify variations between units of each set. Provide full set of optional samples where Architect's/Engineer's selection is required. Prepare samples to match the Architect's/Engineer's sample where so indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and "kind" by Architect/Engineer. Architect/Engineer will not "test" samples (except as otherwise indicated) for other requirements, which are therefore the exclusive responsibility of the Contractor.

4.5 WARRANTIES - In addition to copies desired for Contractor's use, furnish two (2) executed copies, except furnish two (2) additional copies required for maintenance manuals. Furnish same number of copies of specified and coincidental product warranties, where specific execution for project application is not required.

4.6 GENERAL DISTRIBUTION - Provide additional distribution of submittals (not included in the copy submittal requirements) to subcontractors, suppliers, fabricators, installers, governing authorities and others as necessary for proper performance of the work. Include such additional copies in transmittal to Architect/Engineer where required to receive "Action" marking before final distribution.

4.7 ARCHITECT'S/ENGINEER'S ACTION - Where action and return is required or requested, Architect/Engineer will review each submittal, mark with "Action" and, where possible, return within thirty (30) days of receipt. Where submittal must be held for coordination, Contractor will be so advised without delay.

A. **Final Unrestricted Release** - Work may proceed, provided it complies with Contract Documents, when submittal is returned with the following marking:

"No Corrections Noted" or "No Exceptions Taken"

B. **Final-But-Restricted Release** - Work may proceed, provided it complies with notations and corrections on submittal and with Contract Documents, when submittal is returned with the following marking:

"Make Corrections Noted"

C. **Returned for Resubmittal** - Do not proceed with work. Revise submittal in accordance with notations thereon and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking (or unmarked submittals where a marking is required) to be used in connection with performance of the work:

"Revise and Resubmitted"

D. **Returned for Non-Compliance** - Do not proceed with work. Product submitted does not comply with Contract Documents. Resubmit for product complying with the requirements of the Contract Documents. Do not allow submittals with the following marking to be used in connection with performance of the work:

"Rejected – See Remarks"

4.8 OPERATION AND MAINTENANCE MANUALS - After the shop drawings have been approved, the Operation & Maintenance Manuals are then to be submitted to the Architect. At least two (2) copies of these Manuals shall be submitted.

END OF SECTION 013000

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

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

1. General Project coordination procedures.
2. Coordination Drawings.
3. Project meetings.

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

1.2 COORDINATION

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

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

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

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

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.

6. Preinstallation conferences.
7. Project closeout activities.

1.3 SUBMITTALS

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

1. Indicate relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. See Division 23 Section "Basic Mechanical Materials and Methods" for specific Coordination Drawing requirements for mechanical installations.
4. See Division 26 Section "Basic Electrical Materials and Methods" for specific Coordination Drawing requirements for electrical installations.

1.4 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site**.**

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing.
    d. Designation of responsible personnel.
    e. Procedures for processing field decisions and Change Orders.
    f. Procedures for processing Applications for Payment.
    g. Distribution of the Contract Documents.
    h. Submittal procedures.
    i. Preparation of Record Documents.

j. Use of the premises.
k. Responsibility for temporary facilities and controls.
l. Parking availability.
m. Office, work, and storage areas.
n. Equipment deliveries and priorities.
o. First aid.
p. Security.
q. Progress cleaning.
r. Working hours.

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

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related Change Orders.
d. Purchases.
e. Deliveries.
f. Submittals.
g. Review of mockups.
h. Possible conflicts.
i. Compatibility problems.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's written recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities and controls.
q. Space and access limitations.
r. Regulations of authorities having jurisdiction.
s. Testing and inspecting requirements.
t. Required performance results.
u. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements.
4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at monthly intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site utilization.
        8) Temporary facilities and controls.
        9) Work hours.
        10) Hazards and risks.
        11) Progress cleaning.
        12) Quality and work standards.
        13) Change Orders.
        14) Documentation of information for payment requests.

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

    a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Submittals Schedule.
3. Daily construction reports.
4. Field condition reports.
5. Construction photographs.

B. See Division 1 Section "Payment Procedures" for submitting the Schedule of Values.

C. See Division 1 Section "Closeout Procedures" for submitting Project Record Documents at Project closeout.

1.2 DEFINITIONS

A. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.

B. Float: The measure of leeway in starting and completing an activity.

C. Major Area: A story of construction, a separate building, or a similar significant construction element.

1.3 SUBMITTALS

A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

B. Contractor's Construction Schedule: Submit two printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.

C. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
2. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittals" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
3. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Work Restrictions: Show the effect on the schedule of the following:

a. Use of premises restrictions.
b. Seasonal variations.
c. Environmental control.

2. Work Stages: Indicate important stages of construction for each major portion of the Work.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in ten percent increments within time bar.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording events at Project site, including the following:

1. List of subcontractors.
2. High and low temperatures and general weather conditions.
3. Accidents.
4. Stoppages, delays, shortages, and losses.
5. Meter readings and similar recordings.
6. Orders and requests of authorities having jurisdiction.
7. Services connected and disconnected.
8. Equipment or system tests and startups.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information.

Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
2. Requirements for Contractor to provide quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. See Divisions 2 through 33 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.3 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.4 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

C. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Ambient conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size as directed by Architect.
2. Demonstrate the proposed range of aesthetic effects and workmanship.
3. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
4. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
5. Demolish and remove mockups when directed, unless otherwise indicated.

1.6 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agency engaged and a description of the types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and reinspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify

agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS - Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 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 010100 "Summary of Work" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 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 SHEDS AND STORAGE

A. Provide suitable and sufficient enclosed and covered spaces, with raised flooring, to protect materials and equipment subject to damage by weather or construction.

2.2 FENCING AND BARRICADES

A. Provide fences and barricades and protection devices sufficiently to prevent injury to persons or damage to property in accordance with Safety Requirements of applicable standards, codes, ordinances, and insurance agencies.

2.3 SCAFFOLDING

A. Provide scaffolding, ramps, runways, platforms, guards, rails, stairs, and ladders as necessary for this work.

B. Meet safety requirements of applicable standards, codes, ordinances, and insurance agencies.

C. Provide lights and signs to prevent damage or injury.

2.4 LIFTING AND HOISTING

A. Provide hoists, temporary elevators, lifts, cranes, and towers necessary for expediting the handling of materials.

2.5 TEMPORARY FACILITIES

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

B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel.

2.6 ELECTRICITY

A. Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations. Make arrangements for, and provide temporary equipment, poles, wiring, switches, and outlets necessary to provide an adequate supply of electricity for lighting and power for construction purposes.

2.7 WATER

A. Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for

construction operations. Make arrangements for, and provide temporary equipment and piping necessary to provide an adequate supply of water for construction purposes.

2.8 EQUIPMENT

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

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.

2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

2.9 HEAT

A. The General Contractor shall provide temporary heat during the course of the project to provide protection for the work during cold weather.

B. The General Contractor shall pay for fuel and attendance for all heat during construction until the project is accepted by the Owner as substantially complete.

2.10 TELEPHONE

A. Provide and pay for a telephone on site, either cellular or within a field office, for use of persons working on the site. Limit use to business calls. Long distance call charges by the Architect/Engineer and Owner's representatives pertaining to the project will be paid by the Contractor.

2.11 PROJECT SIGN

A. Provide project signs as necessary to inform the public and persons seeking entrance to the Project.

B. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 010100 "Summary of Work."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Sanitary Facilities: Provide drinking water for use of construction personnel. Existing designated toilets within the portion of the building scheduled to remain may be utilized by construction personnel.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

I. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until project has met Substantial Completion and has been accepted by Owner. Personnel remaining after acceptance will be permitted to use permanent facilities, under conditions acceptable to Owner.

J. 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.

K. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

L. 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.

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

1. Identification Signs: Provide Project identification signs as indicated.
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 touchup signs so they are legible at all times.

N. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017000 "Execution Requirements."

O. 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.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

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 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

D. Site Enclosure Fence: Prior to commencing earthwork, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.

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

F. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire prevention program.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.4 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Discard or replace water-damaged and wet material.
4. Discard, replace, or clean stored or installed material that begins to grow mold.
5. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until project is Substantially Complete and has been accepted by the owner.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion and owner acceptance. 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. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

E. Clean spaces that were occupied by temporary work. Remove debris and rubbish from the site.

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for selecting products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. See Division 1 Section "Closeout Procedures" for submitting warranties for contract closeout.

C. See Divisions 2 through 33 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

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

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.3 SUBMITTALS

A. Product List: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
3. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: **Use CSI Form 13.1A. (Copy of this form attached at the end of this Section but also available online as a fillable PDF file).**
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified material or product cannot be provided.
b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.

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

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittals." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products to allow for inspection and measurement of quantity or counting of units.
6. Store materials in a manner that will not endanger Project structure.
7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
9. Protect stored products from damage.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.
3. Refer to Divisions 2 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.

   a. Substitutions may be considered**,** unless otherwise indicated.

2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.

   a. Substitutions may be considered**,** unless otherwise indicated.

3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.

a. Substitutions may be considered**,** unless otherwise indicated.

4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

   a. Substitutions may be considered**,** unless otherwise indicated.

5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
7. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Product" are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.

   a. Substitutions may be considered**,** unless otherwise indicated.

8. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.

   a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.

9. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.

   a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
   b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed. **Requests received after that time may be considered or rejected at discretion of Architect.**

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

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017000 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Progress cleaning.
5. Starting and adjusting.
6. Protection of installed construction.
7. Correction of the Work.

B. See Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility 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 Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: Lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. 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.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.

F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. 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 materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.

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. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

G. 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.

H. 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.

I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017000

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

B. See Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.

C. See Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.

D. See Divisions 2 through 33 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.

10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction

1. Organize list of spaces in sequential order, starting with exterior areas first.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.5 PROJECT RECORD DOCUMENTS

A. General: Protect Project Record Documents from deterioration and loss. **Provide access to Project Record Documents for Architect's reference during normal working hours.**

B. **Record Drawings**: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

   a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
   b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. **Record Specifications**: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders and Record Drawings, where applicable.

D. **Miscellaneous Record Submittals**: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.6 OPERATION AND MAINTENANCE MANUALS

A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

1. Operation Data: Include emergency instructions and procedures, system and equipment descriptions, operating procedures, and sequence of operations.
2. Maintenance Data: Include manufacturer's information, list of spare parts, maintenance procedures, maintenance and service schedules for preventive and routine maintenance, and copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.7 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Provide instructors experienced in operation and maintenance procedures.
2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
3. Schedule training with Owner, through Architect, with at least [**seven**] <**Insert number**> days' advance notice.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
g. Sweep concrete floors broom-clean in unoccupied spaces.
h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
j. Remove labels that are not permanent.

k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels. Do not paint over mechanical and electrical nameplates.

l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

m. Replace parts subject to unusual operating conditions.

n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

q. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017810 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. See Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.

C. See Divisions 2 through 33 Sections for specific requirements for Project Record Documents of products in those Sections.

1.2 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set of marked-up Record Prints.

B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one copy of each Product Data submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION 017810

SECTION 017820 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Emergency manuals.
2. Operation manuals for systems, subsystems, and equipment.
3. Maintenance manuals for the care and maintenance of products, materials, and finishes, systems and equipment.

B. See Divisions 2 through 33 Sections for specific operation and maintenance manual requirements for products in those Sections.

1.2 SUBMITTALS

A. Manual: Submit one copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 30 days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit one copy of each corrected manual within 15 days of receipt of Architect's comments.

PART 2 - PRODUCTS

2.1 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to content of volume, and cross-referenced to Specification Section number in Project Manual.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for type of emergency, emergency instructions, and emergency procedures.

B. Type of Emergency: Where applicable, include instructions and procedures for each system, subsystem, piece of equipment, and component for flood, gas leak, water leak, power failure, water outage, and equipment failure.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include instructions on stopping, shutdown instructions for each type of emergency, operating instructions for conditions outside normal operating limits, and required sequences for electric or electronic systems.

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.

B. Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include startup, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.

D. Systems and Equipment Controls: Describe sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations for inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in the manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment.

D. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions**,** and demonstration and training videotape if available, that detail essential maintenance procedures.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.

F. Comply with Division 1 Section "Closeout Procedures" for the schedule for submitting operation and maintenance documentation.

END OF SECTION 017820

TECHNICAL SPECIFICATIONS

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.
2. Welded-wire reinforcement.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.
2. Bar supports.
3. Mechanical splice couplers (if used).

B. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.

C. Construction Joint Layout:

1. Location of construction joints shall be as indicated on Drawing S101.

1.3 INFORMATIONAL SUBMITTALS

A. Material Test Reports: For the following, from a qualified testing agency:

1. Steel Reinforcement

2. Mechanical splice couplers (if used).

B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615, Grade 60, deformed.

B. Plain-Steel Welded-Wire Reinforcement: ASTM A185, plain, fabricated from as-drawn steel wire into flat sheets.

2.2 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.

1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.

B. Mechanical Splice Couplers (if used): ACI 318 Type 1, same material of reinforcing bar being spliced; tension-compression type.

C. Steel Tie Wire: ASTM A1064, annealed steel, not less than 0.0508 inch in diameter.

1. Finish: Plain.

2.3 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:

1. Do not cut or puncture vapor retarder.
2. 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.

3.2 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.

1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.

1. Bars indicated to be continuous, and all vertical bars shall be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
2. Stagger splices in accordance with ACI 318.

G. Install welded-wire reinforcement in longest practicable lengths.

1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."

   a. For reinforcement less than W4.0 or D4.0, continuous support spacing shall not exceed 12 inches.

2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
4. Lace overlaps with wire.

3.3 JOINTS

A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated on the Drawings.

1. Place joints perpendicular to main reinforcement.
2. Continue reinforcement across construction joints unless otherwise indicated.
3. Do not continue reinforcement through sides of strip placements of floors and slabs.

3.4 INSTALLATION TOLERANCES

A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel-reinforcement placement.
2. Steel-reinforcement mechanical splice couplers (if used).

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including formwork, concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
2. Section 312300 "Earthwork for Structures" for drainage fill under slabs-on-ground.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, and other pozzolans materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Aggregates.
4. 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.

5. Vapor retarders.
6. Liquid floor treatments.
7. Curing materials.
8. Joint fillers.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.

3. Durability exposure class.
4. Maximum w/cm.
5. Slump limit.
6. Air content.
7. Nominal maximum aggregate size.
8. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
9. Intended placement method.
10. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

a. Location of construction joints are indicated on Drawing S101.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Vapor retarders.
5. Joint-filler strips.

B. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Aggregates.
4. Admixtures.

C. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.

D. Preconstruction Test Reports: For each mix design.

E. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.

B. Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete."
2. ACI 117, "Specification for Tolerances for Concrete Construction and Materials."
3. CRSI "Recommended Practice of Placing Reinforcing Bars"
4. AWS D1.4, "Structural Welding Code."
5. ACI "Manual of Standard Practices for Detailing Reinforced Concrete Surfaces."

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

a. Admixture dosage rates.
b. Slump.
c. Air content.
d. Seven-day compressive strength.
e. 28-day compressive strength.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94 and ACI 301.

1.8 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1.

B. Hot-Weather Placement: Comply with ACI 301and ACI 305.1.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

2.2 STEEL REINFORCEMENT

A. Refer to Section 032000, “Concrete Reinforcing” and to Drawing S001, “Structural Notes.”

2.3 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.4 CONCRETE MATERIALS

A. Cementitious Materials:

1. Portland Cement: ASTM C150, Type I/II.
2. Fly Ash: ASTM C618, Class C or F.

B. Normal-Weight Aggregates: ASTM C33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C260.

D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.

1. Water-Reducing Admixture: ASTM C494, Type A.
2. Retarding Admixture: ASTM C494, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017, Type II.

E. Water and Water Used to Make Ice: ASTM C94, potable.

2.5 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A; not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.6 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F: Black.
b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
c. Ambient Temperature Above 85 deg F: White.

C. Curing Paper: Eight-feet wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

D. Water: Potable or complying with ASTM C1602.

E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming, Non-dissipating Curing Compound: ASTM C309, Type 1, Class B, certified by curing compound manufacturer to not interfere with bonding of floor covering.

G. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

2.7 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.

B. Floor Slab Protective Covering: Eight-feet-wide cellulose fabric.

2.8 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned based on laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: 20 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use 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, and concrete with a w/cm below 0.50.

2.9 CONCRETE MIXTURES

A. Class A: Normal-weight concrete used for footings:

1. Exposure Class: ACI 318 F1.
2. Minimum Compressive Strength: 4500 psi at 28 days.
3. Maximum w/cm: 0.45.
4. Slump Limit: 5 inches, plus or minus 1 inch.
5. Air Content:

    a. Exposure Class F1: 4.5 percent, plus or minus 1 percent at point of delivery for concrete containing 1-1/2-inch nominal maximum aggregate size.

B. Class B: Normal-weight concrete used for foundation piers:

1. Exposure Class: ACI 318 F2.
2. Minimum Compressive Strength: 4500 psi at 28 days.
3. Maximum w/cm: 0.45.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content:
    a. Exposure Classes F2: 5.5 – 6.0 percent, plus or minus 1 percent at point of delivery for concrete containing 1-1/2-inch nominal maximum aggregate size.

C. Class C: Normal-weight concrete used for interior slabs-on-ground:

1. Exposure Class: ACI 318 F0.
2. Minimum Compressive Strength: 3000 psi at 28 days.
3. Maximum w/cm: 0.45.
4. Minimum Cementitious Materials Content: 470 lb/cu. yd.
5. Slump Limit: 4 inches, plus or minus 1 inch.
6. Air Content:

    a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.

D. Class D: Normal-weight concrete used for exterior slabs:

1. Exposure Class: ACI 318 F3.
2. Minimum Compressive Strength: 4500 psi at 28 days.
3. Maximum w/cm: 0.45.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content:
    a. Exposure Classes F3: 5.5 – 6.0 percent, plus or minus 1 percent at point of delivery for concrete containing 1-1/2-inch nominal maximum aggregate size.

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94 and furnish batch ticket information.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 INSTALLATION OF 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.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.3 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.

5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.

    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

3.4 JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
2. Place joints perpendicular to main reinforcement.

    a. Continue reinforcement across construction joints unless otherwise indicated.
    b. Do not continue reinforcement through sides of strip placements of floors and slabs.

3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
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.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

D. Isolation Joints in Slabs-on-Ground: 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 on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "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:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

E. 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.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

a. Do not use vibrators to transport concrete inside forms.
b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.

d. 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.

F. 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. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.6 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.

   a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
   b. Remove projections larger than 1 inch.
   c. Tie holes do not require patching.
   d. Surface Tolerance: ACI 117 Class D.
   e. Apply to concrete surfaces not exposed to public view.

2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.

   a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
   b. Remove projections larger than 1/4 inch.
   c. Patch tie holes.
   d. Surface Tolerance: ACI 117 Class B.
   e. Locations: Apply to concrete surfaces exposed to public view, or to be covered with a coating or covering material applied directly to concrete.

3. ACI 301 Surface Finish SF-3.0:

   a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
   b. Remove projections larger than 1/8 inch.
   c. Patch tie holes.
   d. Surface Tolerance: ACI 117 Class A.
   e. Locations: Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete.

B. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.7 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Floor Slab Finish:

1. Refer to Concrete Floor Finishing notes on Drawing S101.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and straightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. 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.
7. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.-long straightedge resting on two high spots and placed anywhere on the surface does not exceed 3/16 inch.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

2. Coordinate required final finish with Architect before application.

3.8 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.9 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305.1, before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces.
2. If forms remain during curing period, moist cure after loosening forms.
3. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:

   a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
   b. Continuous Sprinkling: Maintain concrete surface continuously wet.
   c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
   d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
   e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

      1) Recoat areas subject to heavy rainfall within three hours after initial application.
      2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:

   a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

   a) Lap edges and ends of absorptive cover not less than 12-inches.
   b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches , and sealed by waterproof tape or adhesive.

   a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
   b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

   a) Water.
   b) Continuous water-fog spray.

b. Floors to Receive Curing Compound:

1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
2) Recoat areas subjected to heavy rainfall within three hours after initial application.
3) Maintain continuity of coating, and repair damage during curing period.
4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

c. Floors to Receive Curing and Sealing Compound:

1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
2) Recoat areas subjected to heavy rainfall within three hours after initial application.
3) Repeat process 24 hours later and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.10 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. Contractor is

solely responsible for the appearance and performance of placed concrete product and shall take necessary steps, including testing, repair and/or replacement to provide a suitable final product.

1. No VOIDS allowed in any exposed concrete surfaces. Contractor shall remove and replace all defective concrete as determined by the Architect.

3.11 TOLERANCES

A. Conform to ACI 117.

3.12 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency shall be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31.
2. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency shall report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

a. Test reports shall include reporting requirements of ASTM C31, ASTM C39, and ACI 301, including the following as applicable to each test and inspection:

1) Project name.
2) Name of testing agency.
3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
4) Name of concrete manufacturer.
5) Date and time of inspection, sampling, and field testing.
6) Date and time of concrete placement.
7) Location in Work of concrete represented by samples.
8) Date and time sample was obtained.
9) Truck and batch ticket numbers.
10) Design compressive strength at 28 days.
11) Concrete mixture designation, proportions, and materials.
12) Field test results.
13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size,

design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections:

1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172 shall be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

    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 C143:

    a. 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.
    b. Perform additional tests when concrete consistency appears to change.

3. Slump Flow: ASTM C1611:

    a. 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.
    b. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C231 pressure method, for normal-weight concrete;

    a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C1064:

    a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

6. Compression Test Specimens: ASTM C31:

    a. Cast and laboratory cure two sets of two 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.

b. Cast, initial cure, and field cure two sets of two standard cylinder specimens for each composite sample.

7. Compressive-Strength Tests: ASTM C39.

a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
c. 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.

8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
9. 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 if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
10. 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.
11. Additional Tests:

a. 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.
b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 or by other methods as directed by Architect.

1) Acceptance criteria for concrete strength shall be in accordance with ACI 301, section 1.6.6.3.

12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

3.13 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.

3. Prohibit use of pipe-cutting machinery over concrete surfaces.
4. Prohibit placement of steel items on concrete surfaces.
5. Prohibit use of acids or acidic detergents over concrete surfaces.

END OF SECTION 033000

SECTION 042000 – UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Steel reinforcing bars.

1.2 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 QUALITY ASSURANCE

A. Manufacturer: Obtain masonry units from one manufacturer and of one uniform texture and color.

B. Comply with recommendations of ACI 530.1/ASCE6/TMS 602, "Specifications for Masonry Structures."

1.4 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For reinforcing steel. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of product. For masonry units, include data on material properties.

B. 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 C109 for compressive strength, ASTM C1506 for water retention, and ASTM C91 for air content.
2. Include test reports, according to ASTM C1019, for grout mixes required to comply with compressive strength requirement.

1.6 FIELD CONDITIONS

A. 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.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

2.2 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.

B. CMUs: ASTM C90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi.
2. Density Classification: Lightweight.

C. CMU Lintels: ASTM C1623, matching CMUs in split-face texture, and density classification. Provide lintels with net-area compressive strength not less than that of CMUs.

D. CMU Sill Blocks: Solid units with smooth-ground chamfered top outside edge. ASTM C1623, matching CMUs in split-face texture, and density classification.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150, 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.

B. Masonry Cement: ASTM C91.

C. Hydrated Lime: ASTM C207, Type S.

D. Sand: ASTM C144.

E. Aggregate for Mortar: ASTM C144.

F. Aggregate for Grout: ASTM C404.

G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

H. Water: Potable.

2.4 REINFORCEMENT

A. Continuous Masonry Wire Reinforcing: Truss type, 9 gage welded steel wire, 0.8 ounce hot-dip zinc coating (after fabrication), width 1-1/2" to 2" less wall thickness. All joint reinforcing, and all anchors embedded in masonry shall be galvanized.

B. Uncoated-Steel Reinforcing Bars: ASTM A615 or ASTM A996, Grade 60.

C. 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.

D. Masonry-Joint Reinforcement, General: ASTM A951.

1. Interior Walls: Hot-dip galvanized, carbon steel.
2. Exterior Walls: Hot-dip galvanized carbon steel.
3. Wire Size for Side Rods: 0.148-inch diameter.
4. Wire Size for Cross Rods: 0.148-inch diameter.
5. Spacing of Cross Rods: Not more than 16 inches o.c.
6. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

2.5 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82, with ASTM A153, Class B-2 coating.
2. Steel Sheet, Galvanized after Fabrication: ASTM A1008, Commercial Steel, with ASTM A153, Class B coating.

2.6 MISCELLANEOUS MASONRY ACCESSORIES

A. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226, Type I (No. 15 asphalt felt).

2.7 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.

2.8 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. Use masonry cement mortar unless otherwise indicated.
3. For exterior masonry, use masonry cement mortar.
4. For reinforced masonry, use masonry cement mortar.
5. 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. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.

1. For masonry below grade or in contact with earth, use Type S.
2. For reinforced masonry, use Type S.

C. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C143/C143M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. 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.

B. Build chases and recesses as shown and as required for the work of other trades. Provide not less than 8” of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.

C. Cut masonry units with a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges. Cut units as required to fit adjoining work neatrly. Use full units without cutting wherever possible.

D. Frozen Materials and Work: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen work. Remove and replace masonry work damaged by frost or freezing.

E. Do not lower the freezing point of mortar by use of admixtures or anti-freeze agents. Do not use calcium chloride in mortar and grout. Refer to ACI 1/ASCE 6/TMS602 and 5/TMS 402 for hot and cold conditions for masonry installations.

F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C67. Allow units to absorb water so they are damp but not wet at time of laying.

3.2 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 or minus 1/4 inch.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch 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, or 1/2-inch 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, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch 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, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.3 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. Lay-up walls plumb and true and with courses level, accurately spaced and coordinated with other work.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items. Fill space between hollow metal frames and masonry solidly with mortar. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar and grout into core.

D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs 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.

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. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

D. Cut joints flush for masonry walls which are to be concealed or to be covered with other direct-applied finishes (other than paint) unless otherwise indicated.

E. Remove masonry units disturbed after laying; clean and relay in fresh mortar. Do not pound corners at jambs to fit stretcher unites which have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.

3.5 CAVITY WALLS

A. Bond wythes of cavity walls together as follows:
   1. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.

      a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes or tab-type reinforcement.

B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

3.6 MASONRY-JOINT REINFORCEMENT

A. Provide continuous horizontal joint reinforcing as shown and specified. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch of exterior side of walls and 1/2 inch at other locations. Lap reinforcement a minimum of 6 inches at ends of units. Do not bridge control and expansion joints with reinforcing except at walls openings. Cut and bend units as directed by manufacturer for continuity at returns, offsets, pipe enclosures and other special conditions. Space continuous horizontal reinforcing not more than 16 inches o.c. vertically.

B. Reinforce masonry openings greater than 1 foot with horizontal joint reinforcing placed in 2 horizontal joints approximately 8 inches apart, both immediately above the lintel and immediately below the sill. Extend reinforcing a minimum of 2 feet beyond the jambs of the opening.

3.7 LINTELS

A. Provide precast masonry lintels wherever openings of more than 1 foot are shown. Thoroughly cure precast lintels before handling and installation.

B. Provide a minimum bearing at each jamb of 4 inches for openings less than 6 feet and 8 inches for wider openings.

3.8 REINFORCED UNIT MASONRY

A. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

B. 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/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.9 GROUTING

A. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist group pressure.

B. Comply with requirements of ACI 530/ASCE6/TMS602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

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/ACI 530/ASCE 5.

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. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.

E. Mortar Test (Property Specification): For each mix provided, according to ASTM C780. Test mortar for mortar air content and compressive strength.

F. Grout Test (Compressive Strength): For each mix provided, according to ASTM C1019.

G. Prism Test: For each type of construction provided, according to ASTM C1314 at seven days and at 28 days.

3.11 REPAIRING, POINTING, AND CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
2. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.12 MASONRY WASTE DISPOSAL

A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

B. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 055000 - MISCELLANEOUS METALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 CODES AND STANDARDS: AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings"; AWS "Structural Welding Code"; comply with applicable provisions unless otherwise indicated.

1.3 SHOP DRAWINGS AND DATA: Show complete details and instructions for fabrication, assembly, and installation. Furnish anchor bolts required for installation in other work; furnish templates for bolt installation.

PART 2 - MATERIALS

2.1 INSERTS AND ANCHORAGES

A. Furnish inserts and anchoring devices to be built into other work for installation of miscellaneous metal items; coordinate delivery to job site to avoid delay.

B. Concrete Inserts: Malleable iron (ASTM A 47) or cast steel (ASTM A 27) inserts, with steel bolts, washers and shims; hot dip galvanized.

2.2 FERROUS METALS

A. STEEL PLATES, ANGLES, BARS: ASTM A 36, Grade 50.

B. WIDE FLANGE SHAPES: ASTM A 572, Grade 50.

C. COLD-FORMED STEEL TUBING: ASTM A 500, Grade B.

D. STEEP PIPE: ASTM A 53, Type F or S, Grade A, Standard Weight (Schedule 40).

E. COLD-ROLLED STEEL SHEETS: ASTM A 366.

2.3 PAINT

A. SHOP PAINT: SSPC-Paint 13. Apply to cleaned and degreased steel surfaces at rate to provide a 2.0-mil dry film thickness.

B. GALVANIZING: ASTM A 386 for assembled parts; A153 for iron and steel hardware.

2.4 FABRICATION, GENERAL

A. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Shop-paint all items not specified to be galvanized after fabrication.

1. Cut shapes and holes continuously, grind edges smooth and flush.
2. Consult with architect regarding available templates.

B. Weld corners and seams continuously; grind exposed welds smooth and flush.

C. Form exposed connections with hairline, flush joints; use concealed fasteners where possible.

2.5 ROUGH HARDWARE: Furnish custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes for framing and supporting and anchoring work.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS: Provide as required to complete work and not included with structural steel framework. Fabricate of welded construction in as large units as possible; drill and tap as required to receive hardware and similar items. Include required anchors for building into other work; spaced not more than 24" o.c.

2.7 MISCELLANEOUS STEEL TRIM: Fabricate to shapes and sizes as required for profiles shown; continuous smooth exposed edges. Provide cutouts, fittings, and anchorages; coordinate assembly and installation with other work.

PART 3 - INSTALLATION

3.1 Perform cutting, drilling, and fitting required for installation; set work accurately in location, alignment, and elevation, measured from established lines and levels. Provide anchorage devices and fasteners where necessary for installation to other work.

3.2 Set loose items on cleaned bearing surfaces, using wedges or other adjustments as required. Solidly pack open spaces with bedding mortar, consisting of 1 part Portland cement to 3 parts sand and only enough water for packing and hydration, or use commercial non-shrink grout material.

3.3 Touch-up shop paint after installation. Clean bolted connections and abraded areas and apply same type paint as used in shop. Use galvanizing repair paint on damaged galvanized surfaces.

END OF SECTION 055000

SECTION 061000 – ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood blocking, cants, and nailers.
2. Wood furring and grounds.
3. Wood sleepers.
4. Plywood backing panels.

B. Related Requirements:

1. Section 061600, “Sheathing.”

1.2 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. Engineered wood products.
3. Power-driven fasteners.
4. Post-installed anchors.
5. Metal framing anchors.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber rom 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 lum``ber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 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 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
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 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Framing: Construction or No. 2 grade.

1. Application: Soffit and end wall framing. Blocking.

2. Species:

a. Southern pine or mixed southern pine; SPIB.

3. Application: Framing other than interior partitions.

2.4 ENGINEERED WOOD PRODUCTS

A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.
1. Extreme Fiber Stress in Bending, Edgewise: As indicated.
2. Modulus of Elasticity, Edgewise: As indicated.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Furring.
4. Grounds.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.

C. Concealed Boards: 15 percent maximum moisture content and the following species and grades:

1. Mixed southern pine or southern pine; No. 2 grade; SPIB.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.6 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.7 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 of Type 304/305/316 stainless steel.

B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.

D. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washters.

2.8 METAL FRAMING ANCHORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Simpson Strong-Tie Co., Inc.
   2. MiTek Products

B. Allowable design loads, as published by manufacturer, shall meet or exceed those of basis-of-design products. 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. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653, G60 (Z180) coating designation.

   1. Use for interior locations unless otherwise indicated.

D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch thick.

   1. Use for wood-preservative-treated lumber and where indicated.

2.9 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

B. 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.

C. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. 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 furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

D. Install shear wall panels to comply with manufacturer's written instructions.

E. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

F. Do not splice structural members between supports unless otherwise indicated.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
2. ICC-ES evaluation report for fastener.

3.2 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 SUMMARY

A. Section Includes:

1. Wall Sheathing with integral weather-resistive barrier with fabric faced drainage and ventilation mat.

2. Roof Sheathing.

B. Related Requirements:

1. Section 061000, “Rough Carpentry”.

1.2 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.

1.3 WARRANTY

A. Manufacturer’s Warranty: Manufacturer’s standard form in which manufacturer agrees to repair or replace products that demonstrate deterioration or failure under normal use due to manufacturing defects within warranty period specified, when installed according to manufacturer’s instructions.

1.4 QUALITY ASSURANCE

A. Wall sheathing meeting requirements for water-resistive barrier in accordance with ICC-ES AC310, “Water-resistive Membranes Factory-bonded to Wood-based Structural Sheathing, Used as Water-resistive Barriers.”

B. Drainage and Ventilation Mat meeting requirement for second layer of Weather Resistant Barrier under absorptive cladding as required by Virginia Uniform Statewide Building Code and in accordance with ICC-ESR 5270.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Huber Engineered Woods, LLC, Charlotte, NC; Phone (800) 933-9220; Website: www.huberwood.com.

2.2 PERFORMANCE REQUIREMENTS

A. Single Source Limitations: Provide wall sheathing with integral weather-resistive barrier and drainage and ventilation mat by a single manufacturer.

B. Sheathing Air-Barrier Assembly Air Leakage; Less than 0.04 cfm/sq. ft. at 1.57 lbf/sq. ft., per ASTM E2357 – "Standard Test Method for Determining Air Leakage of Air Barrier Assemblies."

C. Drainage and Ventilation Mat – Water Resistive Barrier: Passes requirements as a Water-Resistive Barrier in accordance with ASTM E2556 – "Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment."

D. Drainage and Ventilation Mat Water-Vapor Permeance, Facer: Minimum 7 perms when tested in accordance with ASTM E96 – "Standard Test Methods for Water Vapor Transmission of Materials – Method B.

2.3 WOOD PANEL PRODUCTS

A. Plywood: DOC PS 1.

B. Kiln-dry material after treatment to a maximum moisture content of 15 percent.

2.4 WALL SHEATHING

A. Oriented-Strand-Board Wall Sheathing: Exposure 1, Structural I, sheathing with factory-laminated water-resistive barrier facer and printed fastener location symbols.

1. Basis of Design: Huber Engineered Woods LLC; Zip System R-Sheathing wall sheathing.

2. Span Rating: Not less than 24/16.

3. Edge Profile: Self-spacing edge profile.

4. Weather Barrier Facer: Medium-density, phenolic-impregnated sheet material qualifying as an ASTM D779 Grade D weather-resistive barrier in accordance with ICC-ES AC38 – "Water Resistive Barriers."

5. Panel exposure period: No damage from weather exposure for up to 180 days.

6. Printed fastener spacing symbols on facer for 16-inch and 24-inch on cn

7. Panel Dimensions: 4’-0” x 8’- 1 1/8”.

8. Nominal Thickness: Not less than 2-inches for R-9.6.

2.5 ROOF SHEATHING

A. Plywood Roof Sheathing: Exterior classification. See Drawing S001, “Structural Wood.”

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153.

2.7 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to 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.

B. Self-Adhering Seam and Flashing Tape: Pressure-sensitive, self-adhering, cold-applied, seam tape consisting of polyolefin film with acrylic adhesive, meeting ICC-ES AC148, “Acceptance Criteria for Flexible Flashing Materials”, and tested as part of an assembly meeting performance requirements.

1. Adhesive Type: Acrylic.
2. Thickness: 0.012 inch.
3. Tensile Strength: 938 psi.
4. Elongation: 400-800 percent.
5. Complies with AAMA 711 – “Voluntary Specification for Self-Adhering Flashing Acceptance Criteria for Flexible Flashing Materials.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code" and as indicated on the drawings.

D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

END OF SECTION 061600

SECTION 061920 - PREFABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS - Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY - Extent and configuration of prefabricated wood trusses is indicated on drawings.

1.3 DEFINITIONS - Prefabricated wood trusses include planar structural units consisting of metal plate connected members which are fabricated from dimension lumber and which have been cut and assembled prior to delivery to the project site.

1.4 SUBMITTALS

A. Product Data: Submit fabricator's technical data covering lumber, metal plates, hardware, fabrication process, treatment (if any), handling and erection.
   1. Submit certificate, signed by an officer of fabricating firm, indicating that trusses to be supplied for project comply with indicated requirements.

B. Shop Drawings: Submit shop drawings showing species, sizes and stress grades of lumber to be used; pitch, span, camber, configuration and spacing for each type of truss required; type, size, material, finish, design values, location of metal connector plates; and bearing and anchorage details.
   1. To the extent engineering design considerations are indicated as fabricator's responsibility, submit design analysis and test reports indicating loading, section modulus, assumed allowable stress, stress diagrams and calculations, and similar information needed for analysis and to ensure that trusses comply with requirements.
   2. Truss shop drawings shall clearly indicate all temporary and permanent bracing, anchors, and connectors required for performance of the truss system consistent with the design assumptions.
   3. Provide shop drawings which have been signed and stamped by a structural engineer licensed to practice in the Commonwealth of Virginia.

1.5 QUALITY ASSURANCE

A. TPI Standards: Comply with applicable requirements and recommendations of the following Truss Plate Institute (TPI) publications:
   1. "Design Specification for Metal Plate Connected Wood Trusses".
   2. "Design Specification for Metal Plate Connected Parallel Chord Wood Trusses".
   3. "Commentary and Recommendations for Handling and Erecting Wood Trusses".
   4. "Commentary and Recommendations for Bracing Wood Trusses".
   5. "Quality Standard for Metal Plate Connected Wood Trusses".

B. Wood Structural Design Standard: Comply with applicable requirements of "National Design Specification for Wood Construction" published by N.F.P.A.

C. Design by Manufacturer: Trusses shall be designed by Connector-plate manufacturer to support all superimposed dead and live loads indicated, with design approved and sealed by a structural engineer licensed to practice in the Commonwealth of Virginia.

D. Connector Plate Manufacturer's Qualifications: Provide truss connector plates manufactured by a firm which is a member of TPI and which complies with TPI quality control procedures for manufacture of connector plates published in TPI "Quality Standard for Metal Plate Connected Wood Trusses".

E. Fabricator's Qualifications
   1. Fabricator shall practice a quality control program which complies with, or is comparable to, one published in TPI "Quality Standard for Metal Plate Connected Wood Trusses" and which involves inspection by an independent inspection and testing agency acceptable to Architect and authorities having jurisdiction.

F. Single Source Responsibility for Connector Plates: Provide metal connector plates from a single manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING

A. Handle and store trusses with care, and in accordance with manufacturer's instructions and TPI recommendations to avoid damage from bending, overturning or other cause for which truss is not designed to resist or endure.

B. Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying work of other trades whose work must follow erection of trusses.

PART 2 - PRODUCTS

2.1 LUMBER

A. Factory mark each piece of lumber with type, grade, mill and grading agency.

B. Lumber Standard: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

C. Inspection Agencies: Inspection agencies and the abbreviations used to reference them to lumber grades and species include the following:
   NLGA - National Lumber Grades Authority (Canadian)
   SPIB - Southern Pine Inspection Bureau
   WCLIB - West Coast Lumber Inspection Bureau
   WWPA - Western Wood Products Association

D. Nominal sizes are indicated, except as shown by detail dimensions.

E. Provide lumber manufactured to actual sizes required by PS 20 to comply with requirements indicated below:

F. Dressed, S4S, unless otherwise indicated.

1. Moisture Content: Seasoned, with 19 percent maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.
2. Grade: No. 1 or 2.
3. Species: Southern Pine graded under SPIB rules.
4. Stress-Rating Method: Visually graded or machine stress-rated.

2.2 METAL CONNECTOR PLATES, FASTENERS AND ANCHORAGES

A. Connector Plates: Fabricate connector plates from metal complying with the following requirements:

B. Hot-Dip Galvanized Steel Sheet: Structural (physical) quality steel sheet complying with ASTM A 446, Grade A; zinc coated by hot-dip process to comply with ASTM A 525, Designation G60; minimum coated metal thickness indicated but not less than 0.036".

C. Fasteners and Anchorages: Provide size, type, material and finish indicated for nails, screws, bolts, nuts, washers and other anchoring devices.

2.3 FABRICATION

A. Cut truss members to accurate lengths, angles and sizes to produce close fitting joints with wood-to-wood bearing in assembled units.

B. Fabricate metal connector plates to size, configuration, thickness and anchorage details required for types of joint designs indicated.

C. Assemble truss members in design configuration indicated using jigs or other means to ensure uniformity and accuracy of assembly with close fitting joints. Position members to produce design camber indicated.

D. Connect truss members by means of metal connector plates accurately located and securely fastened to each side of wood members by means indicated or approved.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Erect and brace trusses to comply with recommendations of manufacturer and the Truss Plate Institute.

B. Erect trusses with plane of truss webs vertical (plumb) and parallel to each other, located accurately at design spacings indicated.

C. Hoist units in place by means of lifting equipment suited to sizes and types of trusses required, applied at designated lift panels as recommended by fabricator, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

D. Provide temporary bracing as required to maintain trusses plumb, parallel and in location indicated, until permanent bracing is installed.

E. Anchor trusses securely at all bearing points to comply with methods and details indicated.

F. Install permanent bracing and related components to enable trusses to maintain design spacing, withstand live and dead loads including lateral loads, and to comply with other indicated requirements.

G. Do not cut or remove truss members.

END OF SECTION 061920

SECTION 062000 - EXTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior wood trim.
   2. Fiber cement trim and siding.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.

   1. Factory mark each piece of lumber with grade stamp of inspection agency, indicating grade, species, moisture content at time of surfacing, and mill.
   2. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.

B. Softwood Plywood: DOC PS 1.

C. Fiber Cement Trim and siding: ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets.

2.2 WOOD TRIM

A. Provide kiln-dried lumber siding complying with DOC PS 20.

B. Species and Grade: Spruce-pine-fir; NeLMA, NLGA, WCLIB, or WWPA 1 Common.

2.3 FIBER CEMENT TRIM AND SIDING

A. Panel siding: ASTM C 1186, type A, Grade II, primed with manufacturer's standard exterior primer.

1. Thickness: 5/16-inch flat sheet

2. Texture: Smooth texture.

3. Finish: Field paint per Section 099000 - Painting.

B. Trim boards: ASTM C 1186, type A, Grade II, primed with manufacturer's standard exterior primer.

1. Thickness: 4/4 and 5/4 thick boards in widths as indicated by drawings

2. Texture: smooth texture.

3. Finish: Field paint per Section 099000 - Painting.

2.4 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches into wood substrate.
1. For western red cedar, provide stainless steel fasteners.
2. For fiber cement trim and siding, provide fasteners in accordance with product manufacturer’s written instructions.
3. For pressure-preservative-treated wood, provide hot-dip galvanized-steel fasteners.
4. For applications not otherwise indicated, provide stainless steel, hot-dip galvanized-steel, or aluminum fasteners.

B. Flashing: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.

1. Horizontal Joint Flashing for Panel Siding: Prefinished-aluminum flashing.

C. Sealants: Latex, complying with ASTM C834 Type OP, Grade NF and applicable requirements in Section 079000 "Joint Sealants," and recommended by sealant and substrate manufacturers for intended application.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Prime lumber and moldings to be painted, including both faces and edges, unless factory primed.

1. Cut to required lengths and prime ends.
2. Comply with requirements in Section 099000, “Painting."

3.2 INSTALLATION, GENERAL

A. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials.

1. Use concealed shims where necessary for alignment.
2. Scribe and cut exterior finish carpentry to fit adjoining work.
3. Refinish and seal cuts as recommended by manufacturer.
4. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
5. Coordinate exterior finish carpentry with materials and systems in or adjacent to it.
6. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

3.3 INSTALLATION OF STANDING AND RUNNING TRIM

A. Install flat-grain lumber with bark side exposed to weather.

B. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary.

1. Use scarf joints for end-to-end joints.
2. Stagger end joints in adjacent and related members.

C. Fit exterior joints to exclude water.

1. Cope at returns and miter at corners to produce tight-fitting joints, with full-surface contact throughout length of joint.
2. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

D. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

3.4 INSTALLATION OF SIDING

A. Install siding to comply with manufacturer's written instructions.

B. Flashing: Install metal flashing as indicated on Drawings and as recommended by siding manufacturer.

C. Finish: Apply finish within two weeks of installation.

END OF SECTION 062000

SECTION 064000 - PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

1.1 SUMMARY

A. Section Includes:

1. Plastic-laminate-faced architectural cabinets.
2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.

B. Related Requirements:

1. Section 064100 "Plastic-Laminate-Clad Countertops."

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including high-pressure decorative laminate and cabinet hardware and accessories.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples:

1. Plastic laminates, for each color, pattern, and surface finish.
2. Thermoset decorative panels, for each color, pattern, and surface finish.

1.3 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

A. Grade: Custom.

B. Type of Construction: Frameless.

C. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.

D. Reveal Dimension: 1/2 inch.

E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Formica Corporation.
   b. Nevamar Company, LLC.
   c. Wilsonart Engineered Surfaces.

F. Laminate Cladding for Exposed Surfaces:

1. Horizontal Surfaces: Grade HGS.
2. Vertical Surfaces: Grade HGS.
3. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.

G. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
2. Drawer Sides and Backs: Thermoset decorative panels with PVC edge banding.
3. Drawer Bottoms: Thermoset decorative panels.

H. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As selected by Architect from laminate manufacturer's full range in the following categories:

   a. Solid colors, matte finish.
   b. Wood grains, matte finish.
   c. Patterns, matte finish.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
   1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Medium-Density Fiberboard: ANSI A208.2, Grade 130.
2. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
3. Softwood Plywood: DOC PS 1.
4. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.
5. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.3 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087000 "Door Hardware."

B. Butt Hinges: 2-3/4-inch, five-knuckle steel hinges made from 0.095-inch- thick metal, and as follows:
   1. Semi-concealed Hinges for Flush Doors: BHMA A156.9, B01361.

C. Back-Mounted Pulls: BHMA A156.9, B02011.

D. Wire Pulls: Back mounted, solid metal, 5 inches long, 2-1/2 inches deep, and 5/16 inch in diameter.

E. Catches: Push-in magnetic catches, BHMA A156.9, B03131.

F. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.

G. Drawer Slides: BHMA A156.9.
   1. Grade 1: Side mounted; full-extension type; zinc-plated steel with polymer rollers.

H. Door Locks: BHMA A156.11, E07121.

I. Door and Drawer Silencers: BHMA A156.16, L03011.

J. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
   1. Satin Stainless Steel: BHMA 630.

2.4 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.5 FABRICATION

A. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

B. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

A. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

B. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.

D. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.

END OF SECTION 064000

SECTION 072000 - BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE: The extent of thermal insulation work is shown on the Plans, by the generic name or by its abbreviation.

1.3 APPLICATION

A. The applications of thermal insulation specified in this section include the following:

1. Blanket-type glass-fiber building insulation.
2. Molded (expanded) polystyrene foam plastic board insulation.

1.4 THERMAL CONDUCTIVITY: The R-Values shown are for the thermal resistance specified for each material. Provide adjusted thicknesses as directed for the equivalent use of material having a different thermal conductivity.

1.5 FIRE PERFORMANCE CHARACTERISTICS

A. Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per the ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.

1. Surface Burning Characteristic: ASTM E 84.
2. Fire Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

1.6 SUBMITTALS

A. Submit manufacturer's specifications and installation instructions for each type of insulation required. Include data substantiating that materials comply with specified requirements. Indicate by transmittal that insulation contractor has received a copy of manufacturer's instructions.

PART 2 - PRODUCTS

2.1 INSULATING MATERIALS

A. Building Thermal Insulation: Glass-Fiber Blanket Insulation, Kraft Faced, ASTM C665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

1. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

2. Provide thicknesses and R-values indicated Drawings.

B. Under-slab perimeter insulation: Molded (Expanded) Polystyrene Board Insulation, Type II: ASTM C578, Type X, 15-psi minimum compressive strength.

1. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.
2. 2” thickness, R-10
3. Water Absorption: 0.10% per volume, ASTM C272
4. Water Vapor Permeance: 1.5 max, ASTM E96

PART 3 - EXECUTION

3.1 PRODUCT HANDLING

A. Protection from Deterioration: Do not allow insulation materials to become wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

B. Protect plastic insulation from exposure to sunlight.

3.2 FIRE HAZARD: Do not deliver plastic insulating materials to the project site ahead of installation time. Protect at all times against ignition. Complete installation and concealment of plastic materials as rapidly as possible in each area of work.

3.3 EXAMINATION OF SUBSTRATE: The Installer must examine the substrate and the conditions under which the insulation work is to be performed and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the insulation work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.4 MANUFACTURER'S INSTRUCTIONS: Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.

3.5 INSTALLATION

A. Extend insulation full thickness as shown on the Plans over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

B. Apply a single layer of insulation of the required thickness, unless otherwise shown, or required to make up the total thickness.

C. Apply insulation units to the substrate by the method indicated, complying with the manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage, to provide permanent placement and support of units.

E. Set vapor barrier faced units with vapor barrier to warm side of construction, except as otherwise shown. Do not obstruct ventilation spaces, except for fire stopping.

END OF SECTION 072000

SECTION 074113 - METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Factory-formed and field-assembled, concealed-fastener, lap-seam metal roof panels.
2. Flashing and trim.
3. Roof gutter and downspouts.
4. Snow guards, seam mounted, pad-style

1.2 PERFORMANCE REQUIREMENTS

A. Wind-Uplift Resistance: Comply with UL 580 for wind-uplift resistance class indicated.

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: 6.24 lbf/sq. ft. (300 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: 6.24 lbf/sq. ft. (300 Pa).

D. Structural Performance: Capable of withstanding the effects of gravity loads and the following loads and stresses:

1. Wind Loads: Minimum design wind pressures of 90 lbf/sq. ft., acting inward or outward.
2. Snow Loads: 20 lbf/sq. ft.
3. Deflection Limits: Vertical deflections no greater than 1/180 of the span.

E. Seismic Performance: Provide metal roof panel assemblies capable of withstanding the effects of earthquake motions determined according to the 2006 Virginia Uniform Statewide Building Code (IBC 2003).

1.3 SUBMITTALS

A. Product Data: For each type of metal roof panel and accessory indicated.

B. Shop Drawings: Show layouts of metal roof panels, including plans, elevations, sections, details, and attachments to other work.

1. Include details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories.
2. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Coordination Drawings: Drawn to scale and coordinating metal roof panel installation with penetrations and roof-mounted items.

D. Samples: For each exposed finish.

E. Material certificates.

F. Product test reports.

G. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

1. Installer's responsibilities include fabricating and installing metal roof panel assemblies and providing professional engineering services needed to assume engineering responsibility.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal roof 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, metal finishes, 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 roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Fluoropolymer Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 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.
2. Aluminum Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E1637.

B. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and a flat pan 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. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   a. AEP Span; “SpanSeam”.
   b. Berridge; “Cee-Lock.”
   c. Metal Sales Manufacturing Corporation; “T-Armor-Flat.”
   d. PacClad; “Snap-Clad”.

2. 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: 0.022 inch, 24 gage.
   b. Exterior Finish: Two-coat fluoropolymer.
   c. Color: Selected by Architect from manufacturer’s standard colors.

2.2 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.

B. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.3 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. 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; 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
2. Joint Sealant: ASTM C920; as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

E. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads.

F. Gutters: K-style profile, 5” wide formed from 0.0179-inch- thick aluminum sheet complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 10-foot-long sections, sized according to SMACNA's "Architectural Sheet Metal Manual." Install gutter supports spaced 36 inches on center, fabricated from same metal as gutters. Provide bronze, copper, or aluminum wire ball strainers at outlets.

G. Downspouts: Rectangular downspouts, 2” x 3”, formed from 0.0179-inch- thick, aluminum sheet in minimum 10-foot-long sections complete with formed elbows and offsets.

2.4 RAIL-TYPE SNOW GUARDS

A. Rail-Type, Flat-Mounted Snow Guards:
1. Description: Units fabricated from metal baseplate anchored to fixed bracket and equipped with one bar, rail, or pipe.
2. Brackets and Baseplate: ASTM B209 aluminum.
3. Bars: ASTM B221 (ASTM B221M) aluminum; match roof panel color.

a. Profile: Square with integral track to accept color-matching inserts of material and finish used for metal roof.

4. Seam Clamps: ASTM B221 aluminum extrusion or ASTM B85/B85M aluminum casting with stainless steel set screws incorporating round nonpenetrating point; designed for use with applicable roofing system to which clamp is attached.

2.5 FABRICATION

A. General: Fabricate and finish metal roof 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. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal roof panel joints with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will minimize noise from movements within panel assembly.

D. 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.

E. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.6 FINISHES

A. 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.
2. Concealed Finish: White or light-colored acrylic or polyester backer finish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install flashings and other sheet metal to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."

3.2 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated on Drawings, wrinkle free, in shingle fashion to shed water, and with end laps of not

less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

1. Apply over the entire roof surface.

B. Apply slip sheet over underlayment before installing metal roof panels.

C. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.3 METAL ROOF PANEL INSTALLATION, GENERAL

A. General: Provide metal roof panels of full length from eave to ridge, unless otherwise indicated or restricted by shipping limitations. Anchor metal roof panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cutting of metal roof panels by torch is not permitted.
2. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels.
3. Provide metal closures at peaks, rake edges, rake walls and each side of ridge caps.
4. Flash and seal metal roof panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
5. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
6. Lap metal flashing over metal roof panels to allow moisture to run over and off the material.

B. Fasteners:

1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and 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 by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies.

1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

3.4 FIELD-ASSEMBLED METAL ROOF PANEL INSTALLATION

A. 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. 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.

B. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

C. 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.

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.

END OF SECTION 074113

SECTION 074293 – METAL SOFFIT PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Flush-profile, concealed fastener, lap-seam metal soffit panels, with related metal trim and accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: 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.

C. Samples: For each type of metal panel indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Warranties: Samples of special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Manufacturer’s Warranty: Executed copy of manufacturer’s warranty.

1.5 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, metal finishes, 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. Finish Warranty Period: 10 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.
2. Deflection Limits: For wind loads, no greater than 1/240 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft.

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 2.86 lbf/sq. ft.

D. 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; material surfaces.

2.2 METAL SOFFIT PANELS

A. Provide factory-formed perforated metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

B. Flush-Profile Metal Soffit Panels; Perforated panels formed with vertical panel edges and a flat pan between panel edges; with flush joint between panels.

1. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet

complying with ASTM A792, Class AZ50 1coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755.

a. Nominal Thickness: 0.040 inch.
b. Surface: Smooth, flat finish.
c. Exterior Finish: Two-coat fluoropolymer
d. Color: As selected by Architect from manufacturer's full range.

2. Aluminum Sheet: Coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

a. Thickness: 0.040 inch.
b. Surface: Smooth, flat finish.
c. High-Performance Organic Finish: Two-coat thermocured system with fluoropolymer coats containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2604.
d. Color: As selected by Architect from manufacturer's full range.

3. Panel Coverage: 12 inches.

4. Panel Height: 2.875 inch.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653, G90 coating designation or ASTM A792, Class AZ50 aluminum-zinc-alloy 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, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. 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 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. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are non-staining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/8 inch thick.
2. Joint Sealant: ASTM C920; as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 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.

2.5 FINISHES

A. 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. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.
3. Concealed Finish: White or light-colored acrylic or polyester backer finish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Miscellaneous Supports: Install sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

1. Soffit Framing: Wire tie furring channels to supports.

3.2 INSTALLATION

A. Metal Soffit Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

B. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.
2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
3. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

D. 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 are permanently watertight.

3.3 CLEANING

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.

END OF SECTION 074293

SECTION 074600 - SIDING

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. Fiber-cement siding.

B. Related Sections:
   1. Section 061000 "Rough Carpentry" for wood furring, grounds, nailers, and blocking.
   2. Section 061600 "Sheathing" for wall sheathing and weather-resistive barriers.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples for Initial Selection: For siding including related accessories.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of siding and related accessories to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.

B. Source Limitations: Obtain each type, color, texture, and pattern of siding, including related accessories, from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a dry, well-ventilated, weathertight place.

1.7 WARRANTY

A. HardiPanel HZ10 vertical siding for 30 years.

B. HardieTrim HZ10 boards for 15 years.

1.8 COORDINATION

A. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

PART 2 - PRODUCTS

2.1 FIBER-CEMENT SIDING

A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. CertainTeed Corp.
      b. James Hardie.
      c. Nichiha Fiber Cement.
   2. Vertical Siding Type: Smooth Vertical siding panel 4 feet x 8 feet.
      a. Texture: Smooth faced, prime finish.
   3. Trim Type: HardieTrim HZ10 boards.
      a. Batten Boards: 2 ½” width.
      b. 4/4 Boards: 3 ½” width.
      c. Fascia Boards: HardieTrim HZ10.
      d. Texture: Smooth faced.
      e. Thickness: 3/4 inch.

2.2 ACCESSORIES

A. Decorative Accessories: Provide the following fiber-cement decorative accessories as indicated:
   1. Door and window casings. 5/4 inch thick, smooth faced.
   2. Moldings and trim.5/4 inch thick, smooth faced.

B. Colors for Decorative Accessories: As selected by Architect from manufacturer's full range of industry colors.

C. Flashing: Provide stainless-steel flashing complying with Section 076200 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.

D. Fasteners:

1. For fastening to wood, use stainless steel siding nails of sufficient length to penetrate a minimum of 1 inch into substrate.
2. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch, or three screw-threads, into substrate.
3. For fastening fiber cement, use stainless-steel fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding and related accessories.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION

A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
   1. Do not install damaged components.

B. Install fiber-cement siding and related accessories.
   1. Install fasteners no more than 24 inches on centers

C. Install joint sealants as specified in Section 079200 "Joint Sealants" as directed by manufacture of siding material to produce a weathertight installation.

3.4 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 074600

SECTION 076000 - GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes prefinished aluminum gutters and downspouts.

B. Related Sections:
1. Section 074113 – Metal Roof Panels
2. Section 076200 - Sheet Metal Flashing and Trim.
3. Section 079000 - Joint Sealers.

1.2 REFERENCES

A. ASTM International:
1. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
5. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet

1.3 SUBMITTALS

A. Section 013000 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on manufactured components, materials, and finishes.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with SMACNA Manual.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Product storage and handling requirements.

B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope to drain.

C. Prevent contact with materials during storage capable of causing discoloration, staining, or damage.

D. Coordinate work with downspout discharge pipe inlet.

PART 2 PRODUCTS

2.1 GUTTERS AND DOWNSPOUTS

A. Product Description:
1. Gutters: Sheet metal; Style K (ogee).
2. Downspouts: Sheet metal; Rectangular profile.

2.2 COMPONENTS

A. Pre-Finished Aluminum Sheet: ASTM B209, manufacturer's standard alloy and temper for specified finish; 0.032 inch thick; shop pre-coated with color as selected from manufacturer's standard colors.

2.3 ACCESSORIES

A. Manufacturer Anchors and Supports: Profiled to suit gutters and downspouts.
1. Anchoring Devices: Type recommended by fabricator.
2. Gutter Supports: Type recommended by fabricator.
3. Downspout Supports: Straps.

B. Fasteners: Same material and finish as gutters and downspouts.

2.4 FABRICATION

A. Roll form gutters and downspouts of profiles and sizes indicated.

B. Manufacture supplied 90 degree miters with sealed joint.

C. Form sections to shape indicated on Drawings, square, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance.

E. Fabricate gutter and downspout accessories; seal watertight.

2.5 FACTORY FINISHING
.

A. Manufacturer's standard coating system.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify surfaces are ready to receive gutters and downspouts.

3.2 PREPARATION

A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to minimum dry film thickness of 15 mil.

3.3 INSTALLATION

A. Sheet Metal: Join lengths with sealed watertight. Flash and seal gutters to downspouts and accessories.

END OF SECTION 076000

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formed roof-drainage sheet metal fabrications.
2. Formed steep-slope roof sheet metal fabrications.
3. Formed wall sheet metal fabrications.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Distinguish between shop- and field-assembled work.
3. Include identification of finish for each item.
4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified.

1.3 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.

1.4 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. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, 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; prepainted by coil-coating process to comply with ASTM A 755/A 755M.

1. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Color: As selected by Architect from manufacturer's full range.

2.3 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 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.

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) 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.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. 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.

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" 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. Obtain field measurements for accurate fit before shop fabrication.

2. 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.
3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. 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 deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

C. 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.

D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in long seamless sections. Furnish flat-stock gutter brackets and gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.

1. Accessories: Wire-ball downspout strainer.

B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors.

1. Fabricate from the following materials:

a. Galvanized Steel: 0.022 inch thick.
b. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

2.6 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

A. Apron, Step, and Backer Flashing: Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

B. Drip Edges: Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

C. Eave, Rake, and Ridge Flashing: Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

2.7 WALL SHEET METAL FABRICATIONS

A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings. Form head and sill flashing with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:

1. Galvanized Steel: 0.022 inch thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

PART 3 - EXECUTION

3.1 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 without excessive oil canning, buckling, and tool marks, 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 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.

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.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch (19 mm) for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not use torches for soldering.
2. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.2 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.

C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 48 inches on center.

D. Expansion-Joint Covers: Install expansion-joint covers at locations and configuration indicated. Lap joints minimum of 4 inches in direction of water flow.

3.3 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.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

E. 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 over base flashing. Lap counterflashing joints minimum of 4 inches.

F. 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.

3.4 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. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.5 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.

END OF SECTION 076200

SECTION 079000 – JOINT SEALANTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 COLORS: To match adjoining materials unless otherwise specified or indicated.

1.3 Locations of caulking and sealants shall be generally at intersections of dissimilar materials, expansion joints, control joints.

1.4 QUALITY ASSURANCE: Prepare sample installation before proceeding with each major type of sealant work. Match project conditions as nearly as possible. Schedule sample installation well in advance of the work, to allow ample time for sealant cure, and review by Architect for adjustment of specified requirements.

PART 2 – MATERIALS

2.1 ELASTOMERIC SEALANT COMPOUNDS

A. One Component Polyurethane Sealant

1. ASTM C 920, Class A, Type I (self-leveling) except Type II for joints which are not horizontal.
2. Provide bituminous-modified product where recommended by manufacturer.

B. Mildew-Resistant Silicone Sealant: 1 part, ASTM C 920, Class A, recommended by manufacturer for use in interior wet areas, acid type, except non-acid type where one or both joint surfaces are porous.

2.2 CAULKING COMPOUNDS: Provide one component polyurethane caulking - ASTM C 920, Class A, Type I (self leveling), except Type II if joints are not horizontal.

2.3 JOINT FILLERS AND SEALANT BACKERS

A. Bituminous/Fiber Joint Filler: ASTM D 1751, Type I, and AASHO M 213.

B. Closed-Cell Semi-Rigid Plastic Joint Filler: Non-staining, compressible, low modulus of elasticity but recommended by manufacturer for retaining poured concrete slabs.

C. Sealant Backer Rod: Non-absorptive closed-cell (or jacketed open cell) compressible/flexible plastic/rubber rod stock which is compatible with sealant per manufacturer's recommendation (polyethylene, butyl, neoprene, polyurethane, PVC).

D. Oakum Joint Filler: Hemp or jute, free of oil and tar.

E. Bond Breaker Tape: Polyethylene or other plastic tape which will not bond to sealant, self-adhesive.

2.4 TRAFFIC JOINTS

A. Polyurethane based, 2-part elastomeric sealant, modified with bituminous compound, recommended by the manufacturer for the surface and service indicated.

B. For foot traffic provide manufacturer's non-tracking variation of specified sealant with sufficiently high modulus of elasticity to withstand indention by stiletto heels.

2.5 CONCRETE FLOOR SEALER: See concrete finishing notes on Drawing S101.

PART 3 - EXECUTION

3.1 JOINT SURFACE PREPARATION:

A. Clean joint surfaces immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond of sealant or caulking compound.

B. For elastomeric sealants, do not proceed with installation of sealant over joint surfaces which have been painted, lacquered, waterproofed or treated with water repellent or other treatment or coating unless a laboratory test for durability (adhesion), has successfully demonstrated that sealant bond is not impaired by coating or treatment. If laboratory test has not been performed, or shows bond interference, remove coating or treatment from joint surfaces before installing sealant.

C. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless sealant manufacturer's printed instructions indicate that alkalinity does not interfere with sealant bond and performance.

D. Roughen joint surfaces on vitreous coated and similar non-porous materials, where sealant manufacturer's data indicates lower bond strength than for porous surfaces. Rub with fine abrasive to produce a dull sheen.

3.2 INSTALLATION:

A. Comply with sealant manufacturer's printed instructions except where more stringent requirements are shown or specified and except where manufacturer's technical representative directs otherwise.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Prime or seal joint surfaces where shown or recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

D. Install sealant backer rod for liquid sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown.

E. Install bond breaker tape where shown and where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.

F. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

G. Install sealants to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of bead.

1. For sidewalks, pavements and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75% of joint width, and neither more than 5/8" deep nor less than 3/8" deep.
2. For normal moving joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
3. For joints sealed with non-elastomeric sealants and caulking compounds, fill joints to a depth in the range of 75% to 125% of joint width.

H. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces including exposed aggregate panels and similar rough textures. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces, by either primer/sealer or the sealant/caulking compound.

I. Remove excess and spillage of compounds promptly as the work progresses. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage, without damage to adjoining surfaces or finishes.

3.3 CURE AND PROTECTION:

A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Do not cure in a manner which would significantly alter material's modulus of elasticity or other characteristics.

B. Installer shall advise Contractor of procedures required for curing and protection of sealants and caulking compounds during construction period, so that they will be without deterioration or damage at time of Owner's acceptance.

3.4 TESTS FOR PERFORMANCE:

A. After nominal cure of exterior joint sealants which are exposed to weather, test for water leaks. Flood joint exposure with water directed from a 3/4" garden hose held perpendicular to wall face,

2'-0" from joint, connected to a water system with 30 psi minimum static water pressure at the nozzle. Move stream of water along joint at an approximate rate of 20 ft. per min.

B. Repair sealant installation at leaks or, if leakage is excessive, replace sealant installation as directed.

END OF SECTION 079000

SECTION 081000 – HOLLOW METAL DOORS AND FRAMES

PART 1 – GENERAL

1.1 RELATED DOCUMENT: Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 STANDARD: Comply with the requirements of Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100), and as herein specified.

1.3 SUBMITTALS: With Manufacturer's standard details and specifications for hollow metal work, submit complete shop drawings including hollow metal work and accessories, showing application to project.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. A recognized producer of hollow metal work complying with the requirements, including, but not limited to, any one of the following:

1. Ceco Door Products
2. Republic Builders Prod. Co.
3. Steelcraft Mfg. Co.

2.2 MATERIALS

A. Steel doors and frames; hot-rolled, pickled and oiled per ASTM A 569 and A 568; cold-rolled per ASTM A 366 and A 568.

B. Galvanized sheets, ASTM A 526 and ASTM A 525, G 60 zinc coating, mill phosphatized. Provide steel doors and frames fabricated from galvanized sheets where indicated.

2.3 ANCHORS AND ACCESSORIES: As shown or detailed or required for proper installation. Use galvanized items for units built into exterior walls, complying with ASTM A 153.

2.4 FABRICATION

A. Fabricate units to be rigid, neat in appearance, and free from defects, warp or buckle. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible.

B. Prepare hollow metal units to receive mortise and concealed finish hardware, including cutouts, reinforcing, drilling and tapping, complying with ANSI A 115 "Specifications for Door and Frame Preparation for Hardware".

C. Reinforce units to receive surface-applied finish hardware to be field applied. 10 gauge hinge reinforcements, and 14 gauge lock reinforcements.

D. Locate finish hardware as indicated or, if not indicated, per DHI "Recommended Locations for Builder's Hardware".

E. Shop paint exposed surfaces of hollow metal units, including galvanized surfaces, using manufacturer's standard baked-on rust inhibitive primer.

2.5 DOORS

A. Comply with SDI-100, of the types and styles indicated, for materials quality, metal gages, and construction details unless otherwise indicated.

B. Provide 20 gauge cold rolled steel construction, with reinforcing at hardware locations, as indicated above.

C. Exterior doors shall be galvanized and insulated to provide a "U" factor of .24 at 70°F and an STC rating of 32 decibels.

D. Provide doors with flush tops and bottoms. Recessed tops and bottoms are not acceptable.

2.6 FRAMES

A. Comply with SDI-100, of the types and styles indicated, for materials quality, metal gages, and construction details.

B. Provide standard hollow metal frames for doors, sidelights, borrowed lights, and other openings as indicated. Provide 16 gauge frames for interior work and 14 gauge for exterior frames or frames exposed to the weather.

C. Prepare frames to receive 3 silencers on strike jambs of single swing frames and on heads of double swing frames. Omit silencers on frames to be weatherstripped.

D. Provide 26 ga. steel plaster guards or mortar boxes, welded to frame, at back of hardware cutouts where installed in concrete, masonry or plaster openings.

E. Protect inside faces of frames in plaster or masonry wall construction using high-build fibered asphalt emulsion coating.

F. Provide 14 gauge metal frame anchors, 3 per jamb, 2 per head.

G. Provide drywall returns for frames to be installed in walls and partitions of drywall construction.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install hollow metal units in accordance with manufacturer's instructions and final shop drawings. Fit doors to frames and floors with clearances specified in SDI-100.

B. Finish hardware is specified in Section 087000, “Door Hardware.”

3.2 ADJUST AND CLEAN:

A. Final Adjustments: Check and readjust operating finish hardware items in hollow metal work prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames which are warped, bowed or otherwise damaged.

B. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

END OF SECTION 081000

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Five-ply flush wood veneer-faced doors for painted finish.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

B. RELATED SECTIONS

1. 081213 Hollow Metal Frames
2. 087100 Door Hardware

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including the following:

1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Door louvers.
5. Door trim for openings.
6. Door frame construction.
7. Factory-machining criteria.
8. Factory finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

1. Door schedule indicating door location, type, size, fire protection rating, and swing.
2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
3. Details of frame for each frame type, including dimensions and profile.
4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
5. Dimensions and locations of blocking for hardware attachment.
6. Clearances and undercuts.
7. Requirements for veneer matching.
8. Apply AWI Quality Certification Program label to Shop Drawings.

1.3 QUALITY ASSURANCE

A. Manufacturer's Certification: Licensed participant in AWI's Quality Certification Program.

B. SUBSTITUTIONS
   1. All substitution requests must be submitted within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the architect and his consultant.

C. MANUFACTURER QUALIFICATIONS
   1. Manufacturer shall be a member in good standing of the Window and Door Manufacturer’s Association (WDMA).
   2. Obtain wood doors from a single manufacturer to ensure uniformity in quality of appearance and construction. All material supplied for this project to conform to WDMA I.S. 1A-97 for custom grade wood doors.

D. DELIVERY, STORAGE, AND HANDLING
   1. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Doors are to be shipped from manufacturer in individual polybags, and shall be inspected immediately upon arrival at jobsite for any damage of defects.
   2. Identify each door with individual opening numbers that correlate with designation system used on shop drawings and contract drawings for door, frames and hardware. Use only temporary, removable, or concealed markings.
   3. Do not deliver or install doors until building is enclosed and weather tight, wet-work is complete and dry, and HVAC system is operating and maintaining ambient temperature and relative humidity at occupancy level in storage and installation areas.

1.4 WARRANTY

A. Warranties shall be in addition to, and not a limitation of other rights the owner may have under the contract documents.

B. Submit written warranty on manufacturer’s standard form signed by the manufacturer agreeing to replace or repair defective doors which have:
   1. Delamination in any degree.
   2. Warp or twist of 1/4” or more in any 3’ x 6” x 7’ plane of door face.
   3. Telegraphing of stile, rail or core through face to cause surface variation in excess of 1/100” in any 3” spans.

C. Contractor shall replace or refinish doors where contractor’s work contributed to rejection or voiding of manufacturer’s warranty.

D. Solid core interior doors shall be warranted for the life of their installation.

PART 2 - PRODUCTS

2.1 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with "Architectural Woodwork Standards."

1. Provide labels and certificates from AWI certification program indicating that doors comply with requirements of grades specified.

2.2 SOLID-CORE, FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR PAINTED FINISH

A. Interior Doors, Solid-Core Five-Ply Veneer-Faced:
1. Performance Grade: ANSI/WDMA I.S. 1A Standard Duty.

2. Architectural Woodwork Standards Grade: Custom.
3. Faces: Single-plywood veneer not less than 1/50 inch thick.

a. Species: White Birch.
b. Cut: Plain sliced (flat sliced).

4. Exposed Vertical and Top Edges: Same species as faces.

a. Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

5. Core for Non-Fire-Rated Doors:

a. ANSI A208.1, Grade LD-1 particleboard.

1) Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

6. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

2.3 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated.

1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory machine doors for hardware that is not surface applied.

1. Locate hardware to comply with DHI-WDHS-3.

2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Install frames level, plumb, true, and straight.

1. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
2. Anchor frames to anchors or blocking built in or directly attached to substrates.

    a. Secure with countersunk, concealed fasteners and blind nailing.
    b. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.

        1) For factory-finished items, use filler matching finish of items being installed.

3. Install fire-rated doors and frames in accordance with NFPA 80.

D. Job-Fitted Doors:

1. Align and fit doors in frames with uniform clearances and bevels as indicated below.

    a. Do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors.

2. Machine doors for hardware.
3. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
4. Clearances:

    a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
    b. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.
    c. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
    d. Comply with NFPA 80 for fire-rated doors.

5. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
6. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.

E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.2 FIELD QUALITY CONTROL

A. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

B. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

C. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

SECTION 085213 WOOD CLAD WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Commercial Wood Clad Casement Crank Out Windows: Operating units complete with hardware, glazing, weather strip, insect screen, jamb extension, and standard anchors, trim, and attachments.

1.2 RELATED SECTIONS

A. Section 013000 – Submittals; Shop Drawings, Product Data, and Samples

B. Section 016000 – Product Requirements: Product Substitution Requests

C. Section 079200 – Joint Sealant: Sill sealant and perimeter caulking.

D. Section 099000 – Painting: Paint or stain other than factory applied finish.

1.3 REFERENCES

A. American Society for Testing Materials (ASTM):

1. E283: Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors

2. E330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Door by Uniform Static Air Pressure Difference

3. E547: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential

4. E2190: Specification for Sealed Insulated Glass Units

5. C1036: Standard Specification for Flat Glass

6. F2090: Standard Specifications for Windows Fall Prevention Devices with Emergency Escape (egress) Release Mechanisms

B. American Architectural Manufacturer's Association/Window and Door Manufacturer's Association (AAMA/WDMA/CSA):

1. AAMA/WDMA/CSA 101/I.S.2/A440-05 Standard/Specification for Window, Skylights, and Doors
2. AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS – North American Fenestration Standard/Specification for Windows, Doors, and Skylights
3. AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS 2011 – Northern American Fenestration Standard/Specification for Windows, Doors, and Skylights

C. WDMA I.S.4: Industry Standard for Water Repellant Preservative Treatment for Millwork

D. Window and Door Manufacturer's Association (WDMA): 101/I.S.2 WDMA Hallmark Certification Program

E. Sealed Insulating Glass Manufacturer's Association/Insulating Glass Certification Council (SIGMA/IGCC)

F. American Architectural Manufacturer's Association (AAMA): 2605: Voluntary Specification for High-Performance Organic Coatings on Architectural Extrusions and Panels

G. National Fenestration Rating Council (NFRC):

1. 101: Procedure for Determining Fenestration Product thermal Properties
2. 200: Procedure for Determining Solar Heat Gain Coefficients at Normal Incidence

1.4 SUBMITTALS

A. Shop Drawings: Submit shop drawings under the provision of Section 013000.

B. Product Data: Submit catalog data under the provision of Section 013000.

C. Samples:

1. Submit corner section under the provision of Section 013000.
2. Include glazing system, quality of construction, and specified finish.

1.5 DELIVERY

A. Deliver in original packaging and protect from weather.

1.6 STORAGE AND HANDLING

A. Prime and seal wood surfaces, including to be concealed by wall construction, if more than thirty (30) days will expire between delivery and installation

B. Store window units in an upright position in a clean and dry storage area above ground to protect from the weather.

1.7 WARRANTY

A. Clear insulating glass with stainless steel spacers is warranted against seal failure caused by manufacturing defects and resulting in visible obstruction through the glass for twenty (20) years from the original date of purchase. Glass is warranted against stress cracks caused by manufacturing defects from ten (10) years from the original date of Substantial Completion.

B. Standard exterior aluminum cladding finish is warranted against manufacturing defects resulting in chalk, fade, and loss of adhesion (peel) per the American Architectural Manufacturer's Association (AAMA) Specification 2605-11 Section 8.4 and 8.9 for twenty (20) years from the original date Substantial Completion.

C. Factory-applied interior finish is warranted to be free from finish defects for a period of five (5) years from the original date of Substantial Completion.

D. Hardware and other non-glass components are warranted to be free from manufacturing defects for ten (10) years from the original date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

A. The Basis of Design product is a factory-assembled "Elevate", series operating exterior swing casement window as manufactured by Marvin Windows and Doors, Warroad, Minnesota. This is not meant to be proprietary. Other manufacturers who regularly engage in the manufacture of similar products will be given consideration, provided the performance requirements of this Section are met.

2.2 FRAME DESCRIPTION

A. Exterior: Vinyl pultruded fiberglass.

B. Interior: Pine with factory applied white painted finish.

2.3 SASH DESCRIPTION

A. Interior: Pine with factory applied white painted finish.

1. Kiln-dried to moisture content no greater than twelve (12) percent at the time of fabrication.

2. Water repellant preservative treated in accordance with WDMA I.S.4.

B. Sash thickness: Manufacturer's standard.

2.4 GLAZING

A. Select quality complying with ASTM C 1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E 2190

B. Glazing method: Insulating glass.

C. Glazing seal: Silicone bedding at interior and exterior.

D. Insulating glass will be altitude adjusted with capillary tubes for higher elevations.

E. Glass Type: Clear, Low E3 without Argon.

2.5 FINISH

A. Exterior: Vinyl pultruded fiberglass.

1. Color: Color shall be selected by the Architect from the manufacturer's standard color chart.

B. Interior Finish options:

1. Factory-applied white primer. Field painted.

C. Hardware: Satin nickel finish.

2.6 HARDWARE

A. Casement operating hardware:

1. Locks: Multi-point sequential concealed locking system in the jamb opposite the hinge side for casement units. Lock handles to be removable, non-handed, and available in the same finishes as the handles. Standard tie bars, cams, and keepers – steel coated with E-Gard ™. The keeper to feature a roller to reduce average lock force and does not easily disengage with the cam even under severe loading.

2. Handles: Standard operating folding handle, zinc plated with standard molded plastic folding cover. Color : Oil Rubbed Bronze (plated).

3. Hinges: One at the sill to the bottom rail and the head jamb to the top rail. Hinges are to be steel coated with E-Gard™. Provide stainless steel hinge track. Units with a frame OM of 20 inches and greater shall use an 18 inch wash/egress hinge to allow the sash to slide across the frame opening.. Units under a frame OM of 20 inches width shall use a standard 2 bar hinge, which will position the sash when fully open to 90degrees.

2.6 WEATHER STRIP

A. Weather strip at the frame shall be a hollow-foamed material bent around a 90-degree corner to allow for seamless corner joints

1. Color: Black.

B. Sash weather strip bulb-shaped glass-filled material

1. Color: Black.

2.7 JAMB EXTENSION

A. Jamb extensions shall be provided for various wall thickness factory-applied for full thickness of exterior walls.

B. Finish: Match interior frame finish.

2.8 INSECT SCREEN

A. Crank Out

1. Aluminum frame finish: Bronze.
2. Screen Frame
   a. Window Frame Height: Extruded Aluminum Screen Frame.

3. Screen mesh: Standard Marvin Bright View™. Optional Charcoal Aluminum Wire.

2.9 ACCESSORIES AND TRIM

A. Installation Accessories:

1. Factory-installed vinyl nailing/drip cap/

2. Installation brackets: As recommended by manufacturer.

3. Masonry brackets: As recommended by manufacturer.

B. Aluminum Extrusions:

1. Profile: Brick mold casing.

2. Finish: Fluoropolymer modified acrylic topcoat applied over primer. Meets or exceeds AAMA 2605 requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Condition: Before installation, verify openings are plumb, square, and of proper dimensions. Report frame defects or unsuitable conditions to the General Contractor before proceeding.

B. Acceptance of Condition: Beginning on installation confirms acceptance of existing conditions.

3.2 INSTALLATION

A. Assemble and install window units according to manufacturer's instruction and review shop drawing.

B. Install sealant and related backing materials at the perimeter of the unit or assembly in accordance with Section 079200 Joint Sealants. Do not use expansive foam sealant.

C. Install accessory items as required.

D. Use finish nails to apply wood trim and mouldings.

3.3 FIELD QUALITY CONTROL

A. Remove visible labels and adhesive residue according to the manufacturer's instructions.

3.4 CLEANING

A. Remove visible labels and adhesive residue according to the manufacturer's instructions.

B. Leave windows and glass in a clean condition.

END OF SECTION 085213

SECTION 087000 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Commercial door hardware for the following:
      a. Swinging doors.

B. Related Sections include the following:
   1. Division 08, Section 081000, "Hollow Metal Doors and Frames."

C. Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.

1.3 SUBMITTALS

A. Product Data: Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Qualification Data: For Architectural Hardware Consultant.

C. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

D. Warranty: Special warranty specified in this Section.

E. Other Action Submittals:
   1. Door Hardware Sets: Prepared by or under the supervision of Architectural Hardware Consultant, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final door hardware sets with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
      a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
      b. Content: Include the following information:
         1) Identification number, location, hand, and material of each door and frame.
         2) Type, style, function, size, quantity, and finish of each door hardware item. Include description and function of each lockset and exit device.
         3) Complete designations of every item required for each door or opening including name and manufacturer.
         4) Fastenings and other pertinent information.

5) Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
6) Explanation of abbreviations, symbols, and codes contained in schedule.
7) Mounting locations for door hardware.
8) Door and frame sizes and materials.

c. Submittal Sequence: Submit the final door hardware sets at earliest possible date, particularly where approval of the door hardware sets must precede fabrication of other work that is critical in Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the door hardware sets.

2. Keying Schedule: Prepared by or under the supervision of Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.

1.4 QUALITY ASSURANCE

A. Architectural Hardware Consultant Qualifications: A person who is currently certified by DHI as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

B. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification related to the final door hardware sets, and include basic installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to Owner by registered mail or overnight package service.

1.6 COORDINATION

A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
    a. Structural failures including excessive deflection, cracking, or breakage.
    b. Faulty operation of operators and door hardware.
    c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
2. Warranty Period: Three years from date of Substantial Completion, except as follows:
    a. Manual Closers: Ten years from date of Substantial Completion.
    b. Locksets: Seven years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section.
    1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products complying with BHMA standard referenced.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in "Door Hardware Sets" Article. Products are identified by using door hardware designations, as follows:
    1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Sets" Article.
    2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.2 HINGES

A. Quantity: Provide the following, unless otherwise indicated:
    1. Three Hinges: For doors with heights 61 to 90 inches.

B. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

C. Basis of Design Manufacturer for Hinges:
    1. Interior Doors: Standard-weight hinges – Ives 5BB1-WT- 4 ½” x 4 ½” steel ball-bearing hinges.

D. Hinge Base Metal: Unless otherwise indicated, provide the following:
    1. Interior Hinges: Steel, with steel pin.
    2. Exterior Hinges: Stainless steel, with non-removable stainless steel pin.

2.3 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: Function numbers and descriptions indicated in door hardware sets comply with the following:
    1. Bored Locks: BHMA A156.2.

B. Bored Locks: BHMA A156.2, Grade 1; Series 4000.
   1. Basis of Design Manufacturer for Extra Heavy Duty Cylindrical Lockset:
      a. Schlage Commercial Lock Division; an Ingersoll-Rand Company (SCH) Extra Heavy Duty Cylindrical Locks ND Series, with Athens (ATH) lever design, 626 satin chrome finish.

2.4 LOCK CYLINDERS

A. High-Security Lock Cylinders: BHMA A156.30**,** Grade 1.

B. Cylinders: Schlage Everest C123 keyway, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
   1. Number of Pins: Six.
   2. Bored-Lock Type: Cylinders with tailpieces to suit locks.
      a. High-Security Grade: BHMA A156.5, Grade 1A, listed and labeled as complying with pick- and drill-resistant testing requirements in UL 437 (Suffix A).

2.5 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference, and as follows:
   1. Master Key System: Cylinders are operated by a change key and a master key.
   2. New cylinders shall be keyed into the existing master key system so that all locksets operate from same master key.

B. Keys: Nickel silver.
   1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
      a. Notation: "DO NOT DUPLICATE**."**
   2. Quantity: In addition to one extra key blank for each lock, provide the following:
      a. Cylinder Change Keys: Three.
      b. Master Keys: Five.

2.6 CLOSERS

A. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the Department of Justice's "2010 ADA Standards for Accessible Design (ASAD)" and ANSI A117.1.
   1. Comply with the following maximum opening-force requirements:
      a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.

B. Door Closers for Means of Egress Doors: Opening force allowable by authorities having jurisdiction. The force for pushing or pulling open a door or gate other than fire doors shall be as follows:
   1. Interior, hinged doors: 5 lbs. maximum.

C. Surface Closers: BHMA A156.4**,** Grade 1, provide arm required for closer to be located on non-public side of door, and for doors opening to the exterior of the building the closers shall be type that allows installation on the interior side of the door.
   1. Basis of Design closers are as scheduled in the Hardware Schedule at the end of this section.

D. Provide closers on the following doors: As indicated in the Hardware Schedule.

2.7 PROTECTIVE TRIM UNITS

A. Size: 2 inches less than door width on push side and 8 inches high.

B. Provide kick plates on doors where scheduled in the Hardware Schedule.

C. Fasteners: Manufacturer's standard machine or self-tapping screws.

D. Metal Protective Trim Units: BHMA A156.6; beveled top and 2 sides; fabricated from the following material:
   1. Material: 0.050-inch- thick stainless steel.
   2. Manufacturers: Provide kick plates model number 8400 in 630 finish as manufactured by the following:
      a. Ives. (IVE): Basis of Design.

2.8 STOPS AND HOLDERS

A. Stops and Bumpers: BHMA A156.16.

B. Provide the door stops at interior doors where indicated in the Hardware Schedule.
   1. Provide wall stops for doors unless other type stops are scheduled or indicated.

C. Silencers for Metal Door Frames: BHMA A156.16, Grade 1; neoprene or rubber, minimum diameter 3/8 inch; fabricated for drilled-in application to frame.

D. Manufacturers:
   1. Ives (IVE) FS444- Basis of Design.

2.9 THRESHOLDS

A. Standard: BHMA A156.21.

B. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)." And ANSI A117.1.
   1. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.

C. Thresholds for Means of Egress Doors: Comply with NFPA 101 and with the ADA. Maximum 1/2 inch high.

D. Provide products by one of the following:
   1. Pemko – 171A.
   2. Reese Enterprises (RE) – S205A.
   3. Zero International (ZRO) – 544A.

2.10 PERIMETER GASKETING AND WEATHER STRIPPING

A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with flexible seal strips that are easily replaceable and readily available from stocks maintained by manuf.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Hager Companies.
      b. National Guard Products.
      c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
      d. Zero International.

B. Door Sweeps: Neoprene or Silicone gasket material held in place by flat aluminum housing or flange; surface mounted to face of door with screws.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Installation: Note that the labor for the installation of door hardware is to be carried out within the scope of Section “Finish Carpentry”.

B. Mounting Heights: Mount door hardware units at heights indicated on Drawings and as follows unless otherwise required to comply with governing regulations.
   1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

C. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

3.3 CLEANING AND PROTECTION.

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

D. Provide manufacturers' catalog cut sheets and maintenance manual sheets of all hardware items that have moving or operating parts to the Owner for his maintenance manuals.

PART 4 – DOOR HARDWARE SCHEDULE

Door Hardware Set #1
Door #1 from Break Room #100 to Exterior.
3'-0" wide x 6'-8" high Kynar finished Aluminum Storefront Door / Aluminum Storefront Frame.

1 Lock Cylinder		US26D
1 Threshold	Pemko 171A	Alum.

Remainder of Door Hardware by Storefront supplier.

Door Hardware Set #2
Door #2 from Toilet #104 to Exterior.
3'-0" wide x 6'-8" high Galvanized Hollow Metal Door / Galvanized and Insulated Hollow Metal Frame.

1 ½ Pair Butts	Ives 5-BB-WT-4 ½" x 4 ½" NRP	US32D
1 Lockset	A150PD (Entrance / Office) ANSI F82	US32D
1 Closer	LCN 1261	US26D
1 Kickplate	Ives 8" high x 34" wide	US32D
1 Threshold	Pemko 171A	Alum.
1 Door Sweep	National Guard 101V	Alum.
1 Floor Stop	Ives FS 444	US26D
1 Set Weatherstripping	National Guard 160V	Alum.

Door Hardware Set #3
Door #3 from Hallway #101 to Toilet #104.
Door #5 from Hallway #101 to Toilet #105.
3'-0" wide x 6'-8" high Prefinished Flush Veneer Solid Core Door / Hollow Metal Frame.

Each door to have:

1 ½ Pair Butts	Ives 5-BB-WT-4 ½" x 4 ½"	US26D
1 Privacy Set	AL40S (Privacy) ANSI F76	US26D
1 Wall Stop	Ives WS404CVX	US26D
1 Kickplate	Ives 8" high x 34" wide	US32D
1 Coat Hook	Bobrick B76727	US32D
3 Silencers	Ives SR 64	Rubber

Door Hardware Set #4
Door #4 from Utility Room #103 to Hallway #101.
3'-0" wide x 6'-8" high Prefinished Flush Veneer Solid Core Door / Hollow Metal Frame.

1 ½ Pair Butts	Ives 5-BB-WT-4 ½" x 4 ½"	US26D
1 Lockset	A150PD (Storeroom) ANSI F86	US32D
1 Closer	LCN 1261	US26D
1 Wall Stop	Ives WS404CVX	US26D
1 Kickplate	Ives 8" high x 34" wide	US32D
3 Silencers	Ives SR 64	Rubber

Door Hardware Set #5
Door #6 from Hallway #101 to Office #102.
3'-0" wide x 6'-8" high Prefinished Flush Veneer Solid Core Door / Hollow Metal Frame.

1 ½ Pair Butts	Ives 5-BB-WT-4 ½" x 4 ½"	US26D
1 Lockset	A150PD (Entrance / Office) ANSI F82	US32D
1 Closer	LCN 1261	US26D
1 Wall Stop	Ives WS404CVX	US26D
1 Kickplate	Ives 8" high x 34" wide	US32D
3 Silencers	Ives SR 64	Rubber

END OF SECTION 087000

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Doors

1.2 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Glazing Schedule: Use same designations indicated on Drawings.

1.3 QUALITY ASSURANCE

A. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1.

B. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council.

1.4 WARRANTY

1. Manufacturer's Special Warranty: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. AGC Flat Glass, North America.
2. PPG Industries, Inc.
3. Pilkington North America, Inc.

2.2 GLASS PRODUCTS

A. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; of class, 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. Provide Kind HS (heat-strengthened) float glass in place of annealed float glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
3. For uncoated glass, comply with requirements for Condition A.
4. For coated vision glass, comply with requirements for Condition C (other uncoated glass).
5. Provide Kind HS (heat-strengthened) float glass where safety glass is indicated.
6. Where located: Interior (non-fire-rated) door glazing.

2.3 GLAZING GASKETS

A. Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

1. Neoprene, ASTM C 864.

2.4 GLAZING TAPES

A. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:

1. Type 1, for glazing applications in which tape acts as the primary sealant.

2.5 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, 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 with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

2.6 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to glaze 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.

2.7 MONOLITHIC FLOAT-GLASS UNITS

A. Uncoated Clear Float-Glass Units: Class 1 (clear) Kind HS (heat strengthened) float glass.

1. Thickness: 1/4-inch.

PART 3 - EXECUTION

3.1 GLAZING

A. General: 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.

1. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
2. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
3. 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.
4. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
5. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

6. 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.

B. Tape Glazing: Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

1. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
2. 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.
3. Apply heel bead of elastomeric sealant.
4. 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.
5. Apply cap bead of elastomeric sealant over exposed edge of tape.

C. Gasket Glazing (Dry): Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

1. 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.
2. 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.
3. Install gaskets so they protrude past face of glazing stops.

3.2 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.

B. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION 088000

SECTION 089100 - GABLE LOUVERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum Gable Louvers.

1.2 RELATED SECTIONS

A. Section 061000 - Rough Carpentry.

B. Section 061600 – Sheathing.

C. Section 074600 – Siding.

D. Section 076000 - Flashing and Sheet Metal.

E. Section 079200 - Joint Sealants.

1.3 ACTION SUBMITTALS

A. Submit under provisions of Section 013000.

B. Product Data: For each product to be used, including:
   1. Manufacturer's product data including performance data.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.

C. Shop Drawings:
   1. Submit shop drawings indicating materials, construction, dimensions, accessories, and installation details.

D. Samples: Submit sample of louver to show frame, blades, bird screen, gutters, downspouts, vertical supports, sill, accessories, finish, and color.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and Installer.

B. Product Test Reports: For each type of louver, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For manufacturer's warranties.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions.

C. Handling: Protect materials and finishes during handling and installation to prevent damage.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.6 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.7 WARRANTY

A. Manufacturer shall provide standard limited warranty for louver systems for a period of five years (60 months) from date of installation, no more than 60 months after shipment from manufacturing plant. When notified in writing from the Owner of a manufacturing defect, manufacturer shall promptly correct deficiencies without cost to the Owner.

PART 2 PRODUCTS

2.1 MANUFACTURE

A. Model: Triangle Aluminum Gable Vent Louver with insect screen and nail flange.

B. Fabrication:
   1. Frame:
      a. Frame Depth: 1-inch, minimum.
   2. Blades:
      a. Style: Horizontal.
      b. Material: Aluminum.
   3. Size: 16” high x 64” wide x 1” deep.

2.2 ACCESSORIES

A. Insect Screens:
   1. Fiberglass: 18-16 mesh.
   2. Frame: Sealed into frame.

B. Nail flange.

2.3 FINISHES

A. Finish: Paintable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect areas to receive louvers. Notify the Architect of conditions that would adversely affect the installation or subsequent utilization of the louvers. Do not proceed with installation until unsatisfactory conditions are corrected.

B. If opening preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean opening thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install louvers at locations indicated on the drawings and in accordance with manufacturer's instructions.

B. Install louvers plumb, level, in plane of wall, and in alignment with adjacent work.

C. The supporting structure shall be designed to accommodate the point loads transferred by the louvers when subject to the design wind loads.

D. Install joint sealants as specified in Section 079200.

E. Apply field topcoat within 6 months of application of shop prime coat. Apply field topcoat as specified in Section 099000. Match adjacent siding color.

3.4 CLEANING

A. Clean louver surfaces in accordance with manufacturer's instructions.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 089100.

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior moisture-resistant gypsum board.
2. Exterior gypsum board for ceilings and soffits.
3. Tile backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:
1. Moisture-resistant gypsum board.
2. Exterior gypsum soffit board.
3. Cementitious backer units.
4. Interior trim.
5. Exterior trim.
6. Joint treatment materials.

PART 2 - PRODUCTS

2.1 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.

2.2 INTERIOR GYPSUM BOARD

A. Moisture-Resistant Gypsum Board: ASTM C630. With moisture- and mold-resistant core and paper surfaces.

1. Core: 5/8-inch, regular type.
2. Long Edges: Tapered.

2.3 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C1396, with manufacturer's standard edges.
1. Core: 1/2-inch, regular type.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges.
   1. Thickness: 1/2 inch.
   2. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

   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. Expansion (control) joint.

B. Exterior Trim: ASTM C1047.

   1. Material: Hot-dip galvanized-steel sheet, plastic, or rolled zinc.
   2. Shapes:

      a. Cornerbead.
      b. LC-Bead: J-shaped; exposed long flange receives joint compound.
      c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:

   1. Interior Gypsum Board: Paper.
   2. Exterior Gypsum Soffit Board: Paper.
   3. 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 setting-type taping compound.

      a. Use setting-type compound for installing paper-faced metal trim accessories.

   3. Fill Coat: For second coat, use setting-type, sandable topping compound.
   4. Finish Coat: For third coat, use setting-type, sandable topping compound.

D. Joint Compound for Exterior Applications:

1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.

E. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.7 AUXILIARY MATERIALS

A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION AND FINISHING OF PANELS

A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

B. Comply with ASTM C840 and GA-216.

C. Provide gypsum wallboard of the thickness indicated complying with manufacturer’s recommendations for the application indicated.

D. Install gypsum wallboard in lengths and directions that will minimize the number of end joints and avoid end joints in central areas of ceilings.

E. Nail or screw gypsum wallboard to supports as recommended by manufacturer, unless otherwise noted.

F. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-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.

G. Provide casing bead at exposed edges of gypsum wallboard and wherever wallboard abuts with other wall or ceiling finishes.

H. Provide flush joint treatment and nail or screw-head treatment for exposed drywall work. Apply tape and compound in not less than three applications, sanding smooth after last two.

Final gypsum finish shall be a smooth, uniform, plaster-like finish free of pop outs, depressions, ghosting of wallboard joints, and other surface irregularities.

I. 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.

J. Prefill open joints, rounded or beveled edges, and damaged surface areas.

K. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

L. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. 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 099123 "Interior Painting."

M. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.2 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 093000 – PORCELAIN TILE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Glazed porcelain wall tile.
   2. Crack-suppression membrane for thin-set tile installations.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints.

C. Samples:
   1. Each type, composition, color, and finish of tile.
   2. Grout joints for each type, composition, color, and finish of tile.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 TILE PRODUCTS

A. Available Manufacturers:
   1. American Olean; Div. of Dal-Tile International Corp.
   2. Daltile; Div. of Dal-Tile International Inc.
   3. Florida Tile Industries, Inc.
   4. ROCA Tile USA.
   5. Summitville Tiles, Inc.

B. ANSI Porcelain Tile Standard: Provide Standard grade tile that complies with ANSI A137.3, "Specifications for Porcelain Tile," for types, compositions, and other characteristics indicated.

C. Glazed Wall Tile: Flat tile as follows:
   1. Module Size: 12 by 12 inches. 2 inches x 2 inches tile size.
   2. Thickness: 1/4 inch.
   3. Face: Plain with modified square edges or cushion edges.
   4. Finish: Mat, opaque glaze.
   5. Color: As selected by Architect from manufacturer's full range.
   6. Basis-of-Design Product: Roca Tile "unglazed dot mounted porcelain mosaic.'

D. Glazed Wall Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing where applicable.
   1. Base: Coved 2 by 12 inches. Total height 6 inches.
   2. Wainscot Cap: Bullnose, module size 2 by 2 inches, except at wet wall.
   3. External Corners: 2 x 2 inches bullnose corner.
   4. Internal Corners: Field-butted square corners except with coved base and cap angle pieces designed to fit with stretcher shapes.
   5. Color: As selected by Architect from manufacturer's full range.
   6. Basis-of-Design Product: Roca Tile

2.3 ACCESSORY MATERIALS

A. Crack-Suppression Membranes for Thin-Set Tile Installations: Manufacturer's standard product that complies with ANSI A118.10**,** selected from the following.
   1. Fabric-Reinforced, Fluid-Applied Product: Liquid-latex rubber with fabric reinforcement.
      a. Available Products:
         1) LATICRETE International Inc.; Laticrete 9235 Waterproof Membrane.
         2) MAPEI Corporation; PRP M19.
         3) Summitville Tiles, Inc.; S-9000.
   2. Latex-Portland Cement Product: Flexible mortar with acrylic-latex additive.
      a. Available Products:
         1) MAPEI Corporation; PRP 315.
         2) Southern Grouts & Mortars, Inc.; Southcrete 1100.
         3) TEC Specialty Products Inc.; TA-324, Triple Flex.

2.4 SETTING AND GROUTING MATERIALS

A. Available Manufacturers:
   1. DAP, Inc.
   2. LATICRETE International Inc.
   3. MAPEI Corporation.
   4. Summitville Tiles, Inc.
   5. TEC Specialty Products Inc.

B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
   1. Prepackaged dry-mortar mix containing dry additive to which only water must be added.
   2. Prepackaged dry-mortar mix combined with liquid-latex additive.
   3. For wall applications, provide nonsagging mortar.

C. Polymer-Modified Tile Grout: ANSI A118.7, color as as selected from manufacturer's standards.

2.5 MISCELLANEOUS MATERIALS

A. Elastomeric Sealants: Elastomeric sealants of base polymer and characteristics indicated.
   1. One-Part, Mildew-Resistant Silicone: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for in-service exposures of high humidity and extreme temperatures.
      a. Available Products:
         1) Dow Corning Corporation; Dow Corning 786.
         2) GE Silicones; Sanitary 1700.
         3) Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
         4) Tremco, Inc.; Tremsil 600 White.

B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials.

C. Metal Edge Strips: Angle or L-shape, half-hard brass exposed-edge material.

D. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

B. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions.

C. Remove protrusions, bumps, and ridges by sanding or grinding.

D. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.

E. Field-Applied Temporary Protective Coating: Where needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.2 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.

C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

F. Lay out tile wainscots to next full tile beyond dimensions indicated.

G. Grout tile to comply with requirements of ANSI A108.10, unless otherwise indicated.

H. Install tile on walls with the following joint widths:
   1. Glazed Wall Tile: 1/16 inch.

I. Apply grout sealer to grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer that has gotten on tile faces by wiping with soft cloth.

3.3 WALL TILE INSTALLATION SCHEDULE

A. Interior wall installation; thin-set mortar; TCA W202
   1. Thin-Set Mortar: Latex-portland cement mortar.
   2. Grout: Polymer-modified grout.

END OF SECTION 093000

SECTION 099000 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Samples: For each type of finish-coat material indicated.

1.3 QUALITY ASSURANCE

A. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5.
   1. Wall Surfaces: Provide samples on at least 9 sq. ft.

1.4 PROJECT CONDITIONS

A. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.

B. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.

C. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.

D. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.5 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and, in the quantities, described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
   1. Quantity: 3 percent, but not less than 1 gal, of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
   1. ICI Dulux Paint Centers (ICI Dulux Paints).
   2. PPG Industries, Inc. (Pittsburgh Paints).
   3. Sherwin-Williams Co. (Sherwin-Williams).

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. Colors: As selected from manufacturers’ full range.

2.3 PREPARATORY COATS

A. Exterior Primer: Exterior latex-based primer of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.
   1. Ferrous-Metal Substrates: Rust-inhibitive metal primer.

B. Interior Primer: Interior latex-based primer of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.
   1. Ferrous-Metal Substrates: Quick drying, rust-inhibitive metal primer.

2.4 EXTERIOR FINISH COATS

A. Exterior Semigloss Acrylic Enamel:
   1. ICI Dulux Paints; 2406-XXXX Dulux Professional Exterior 100 Percent Acrylic Semi-Gloss Finish.
   2. Pittsburgh Paints; 6-900 Series SpeedHide Exterior House & Trim Semi-Gloss Acrylic Latex Paint.
   3. Sherwin-Williams; A-100 Latex Gloss A8 Series.

2.5 INTERIOR FINISH COATS

A. Interior Low-Luster Acrylic Enamel: (Eggshell)
   1. ICI Dulux Paints; 1402-XXXX Dulux Professional Acrylic Eggshell Interior Wall & Trim Enamel.
   2. Pittsburgh Paints; 6-400 Series SpeedHide Eggshell Acrylic Latex Enamel.
   3. Sherwin-Williams; ProMar 200 Interior Latex Egg-Shell Enamel B20W200 Series.

B. Interior Semigloss Acrylic Enamel: (Semigloss - Toilets, Janitor, Mechanical/ Electrical)
   1. ICI Dulux Paints; 1406-XXXX Dulux Professional Acrylic Semi-Gloss Interior Wall & Trim Enamel.
   2. Pittsburgh Paints; 6-500 Series SpeedHide Interior Semi-Gloss Latex.
   3. Sherwin-Williams; ProMar 200 Interior Latex Semi-Gloss Enamel B31W200 Series.

PART 3 - EXECUTION

3.1 APPLICATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

C. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

D. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
   1. Provide barrier coats over incompatible primers or remove and reprime.
   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.
   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 SSPC's recommendations.
      a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
      b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
      c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

E. Material Preparation:
   1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and 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. If necessary, remove surface film and strain material before using.

F. Exposed Surfaces: Include areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
   1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   2. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
   3. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
   4. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

G. Sand lightly between each succeeding enamel coat.

H. 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. Omit primer over metal surfaces that have been shop primed and touchup painted.
   2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.

I. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

J. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.

K. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

L. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by 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.

M. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary 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.

3.2 CLEANING AND PROTECTING

A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

B. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

C. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
   1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.3 EXTERIOR PAINT SCHEDULE

A. Exterior Gypsum Board and Fiber Cement Board:
   1. Acrylic Finish: Two finish coats over an exterior alkyd- or alkali-resistant primer.
      a. Primer: Exterior gypsum soffit board primer.
      b. Finish Coats: Exterior semigloss acrylic enamel.

B. Ferrous Metal:
   1. Acrylic Finish: Two finish coats over a rust-inhibitive primer.
      a. Primer: Exterior ferrous-metal primer (not required on shop-primed items).
      b. Finish Coats: Exterior semigloss acrylic enamel.

3.4 INTERIOR PAINT SCHEDULE

A. Wood and Hardboard:
   1. Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior wood primer for acrylic-enamel and semigloss alkyd-enamel finishes.
      b. Finish Coats: Interior semigloss acrylic enamel.

B. Gypsum Board: (Eggshell finish)
   1. Acrylic Finish: Two finish coats over a primer.
      a. Primer: Interior gypsum board primer.
      b. Finish Coats: Interior low-luster acrylic enamel (eggshell).

C. Gypsum Board: (Semigloss finish at Toilets, Mechanical Electrical Room, Janitor Closet).
   1. Acrylic Finish: Two finish coats over a primer.
      a. Primer: Interior gypsum board primer.
      b. Finish Coats: Interior semigloss acrylic enamel.

D. Ferrous Metal:
   1. Acrylic Finish: Two finish coats over a primer.
      a. Primer: Interior ferrous-metal primer.
      b. Finish Coats: Interior semigloss acrylic enamel.

END OF SECTION 099000

SECTION 105200 - FIRE-PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Portable fire extinguishers.
   2. Fire-protection cabinets for the following:
      a. Portable fire extinguishers.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection cabinets.
   1. Fire Extinguishers: Include rating and classification.
   2. Fire-Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

B. Maintenance Data: For fire extinguishers and fire-protection cabinets to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain fire extinguishers and fire-protection cabinets through one source from a single manufacturer.

B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1.5 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

B. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:
   1. Sheet: ASTM B 209 (ASTM B 209M).
   2. Extruded Shapes: ASTM B 221 (ASTM B 221M).

C. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.2 PORTABLE FIRE EXTINGUISHERS

A. Available Manufacturers:
   1. JL Industries, Inc.
   2. Kidde Fyrnetics.
   3. Larsen's Manufacturing Company.

B. General: Provide fire extinguishers of type, size, and capacity for each fire-protection cabinet indicated.
   1. Valves: Manufacturer's standard.
   2. Handles and Levers: Manufacturer's standard.
   3. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.

C. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 3A-40BC, 5-lb (2.3-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.3 FIRE-PROTECTION CABINET

A. Available Manufacturers:

   1. JL Industries, Inc.
   2. Kidde Fyrnetics.
   3. Larsen's Manufacturing Company.

B. Basis of Design for fire extinguisher cabinets is model # 2712-RL semi-recessed ADA compliant cabinet as manufactured by Larsen’s Manufacturing Company. This is not meant to be proprietary. Other manufacturers who regularly engage in the fabrication of similar products will be given consideration as an equal.

C. Cabinet Type: Suitable for fire extinguisher.

D. Cabinet Construction: Rated.

E. Cabinet Material: Enameled-steel sheet.
   1. Shelf: Same metal and finish as cabinet.

F. Semi-recessed Cabinet: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated for Basis of Design product.

G. Cabinet Trim Material: Same material and finish as door.

H. Door Material: Aluminum.

I. Door Style: Fully glazed panel with frame.

J. Door Glazing: Tempered float glass (clear).

K. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
   1. Provide manufacturer's standard latch.
   2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.

L. Accessories:
   1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

M. Finishes:
   1. Manufacturer's standard baked-enamel paint for the following:
      a. Interior of cabinet: white
   2. Door and Frame aluminum.
      a. Color: clear anodic aluminum

2.4 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
   1. Weld joints and grind smooth.
      a. Provide factory-drilled mounting holes.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
   1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
   2. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.5 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.

2.7 STEEL FINISHES

A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond using manufacturer's standard methods.

B. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed cabinets will be installed.

B. Examine fire extinguishers for proper charging and tagging.
   1. Remove and replace damaged, defective, or undercharged units.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for recessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. General: Install fire-protection specialties in locations and at mounting heights indicated or, if not indicated, at heights indicated below:
   1. Fire-Protection Cabinets: 54 inches (1372 mm) above finished floor to top of cabinet.

B. Fire-Protection Cabinets: Fasten fire-protection cabinets to structure, square and plumb.
   1. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection specialties are installed, unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet manufacturer.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 105200

SECTION 104400 - SPECIALTY SIGNS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUBMITTALS

A. Samples: Submit samples of each color and finish of exposed materials and accessories required for specialty signs. Architect's review of samples will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

B. Shop Drawings: Submit shop drawings and schedules for fabrication and erection of specialty signs. Show anchorages and accessory items. Provide location template drawings for items supported or anchored to permanent construction.

1.3 MANUFACTURERS:

A. Provide specialty signs as manufactured by one of the following:
1. Architectural Graphics, Inc.
2. Andco Industries Corporation
3. Best Manufacturing Company
4. Matthews Architectural Division
5. Mohawk Sign Systems

PART 2 - PRODUCTS

2.1 INTERIOR SIGNS

A. Plastic Sand-Carved Signs: Use two-color laminated ES plastic sheets, approximately 1/8" thick. Sand carve to expose contrasting inner core color, producing raised tactile and braille characters and border. Provide ½” radius corners. Stroke width and depth shall meet the requirements of ADA (Americans with Disabilities Act). Colors to be selected by Architect from manufacturer's standards.

1. Room sign shall be approximately 6” x 6” (6” x 8” at toilets) and show the name of the space and appropriate braille symbols. On signs at toilets, also include picture symbol and the handicapped accessibility symbol. Provide one sign as scheduled on Drawing A603.

2.2 EXTERIOR SIGNS

A. Provide accessible parking signs and posts where indicated. The signs shall comply with ADA requirements.

PART 3 - EXECUTION

3.1 INSPECTION: Installer must examine the substrates and conditions under which the specialty signs are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 INSTALLATION

A. Install sign units and components as directed by Architect, securely mounted with concealed fasteners, unless otherwise shown. Attach signs to substrates in accordance with the manufacturer's instructions.

B. Door signs shall be mounted on the wall on the latch side of the doors, 4" from the door frame. The top of the sign shall be mounted 64" above the finished floor.

C. Install level, plumb, and at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by the Architect.

END OF SECTION 10440

SECTION 108000 - TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification Sections, apply to this Section.

1.2 SUBMITTALS: Submit manufacturer's data and installation instructions for each accessory for Architect's review and approval.

1.3 DESCRIPTION OF WORK: The extent of each type of accessory is shown on the drawings and specified herein.

A. This Section includes:
   1. Toilet and bath accessory items.

1.4 PRODUCTS: Provide products of the same manufacturer for each type of accessory unit and for units exposed in the same areas, wherever possible.

1.5 MANUFACTURER

A. Provide toilet accessories as manufactured by one of the following:

   1. American Specialties, Inc.
   2. Bobrick Washroom Equipment, Inc.
   3. Bradley Corporation

PART 2 - PRODUCTS

2.1 MIRRORS (T-1): 1/4" thick, mirror glazing quality polished plate glass with protective copper backing over silver coating and non-metallic elastic paint. Backing of resilient, non-absorbent filler with 20 ga. galvanized steel backing plate. Provide hanger device and slots for concealed mounting. Frame to be 20 ga. stainless steel channel with satin finish, 24" x 36" closed return. Mount at 39" above finish floor to bottom of glass. Provide one unit over each lavatory.

2.2 PAPER TOWEL DISPENSER (T-2): Dispenses 200 C-fold or 275 Multi-fold paper towels; entire unit fabricated of 22 gauge stainless steel. Approximate size: 11" x 8" x 4". Mount at 46" above finished floor to towel slot.

2.3 LIQUID SOAP DISPENSERS (T-3): Surface mounted, horizontal dispensers with push-in valve dispenses a measured amount of liquid soap. Capacity shall be 40 fl. oz. Cover shall be type 304 stainless steel with Architectural satin finish. Mount at 40” above finished floor. Provide one unit at each lavatory.

2.4 TOILET PAPER DISPENSERS (T-4): Double-roll toilet tissue dispenser shall have a heavy-duty cast-aluminum bracket with satin finish. Theft-resistant spindles shall be molded high-impact ABS with retractable pins and concealed locking mechanisms. Unit shall accommodate two standard core toilet tissue rolls up to 6" (152mm) diameter (2000 sheets).

2.5 GRAB BARS (T-5, T-6, T-7, T-8): Provide stainless steel grab bars with concealed mounting, 1-1/2" o.d., wall thickness 0.49" (18 ga.), with peened, knurled, or striated non-slip gripping surface, capable of supporting 250 pounds, 42", 36" and 18” long. Provide one set at each water closet.

2.6 SHOWER SEAT (T-9):

2.7 SHOWER ROD, HOOKS, AND CURTAIN (T-10): Shower curtain rod, Type 304, 20-gage stainless steel with satin finish. 1 3/8” flanges with 1” outside diameter rod. Concealed mounting brackets. Provide 70” wide x 72” high opaque, matte white vinyl shower curtain, 0.0008” thick, containing antibacterial and flame-retardant agents. White HDPE grommets along top, one every 6” on center. Bottom and sides hemmed. Provide twelve (12) stainless steel shower curtain hooks.

2.8 TOWEL BAR (T-11): Surface-mounted towel bar shall be type-304 stainless steel with satin finish. Flanges and support arms shall be 22 gauge (0.8mm) and equipped with concealed, 18-gauge (1.8mm) mounting brackets that are secured to concealed, 19-gauge (1.0mm) wall plates with stainless steel locking setscrews. Towel bar shall be round 3/4" (19mm) diameter tubing.

2.9 DOUBLE ROBE HOOKS (T-12): Coat hooks shall be provided on all Toilet doors fabricated of type 304 18-8 alloy stainless steel 22 gauge, concealed 16-gauge stainless steel mounting bracket, all-welded construction secured to wall plate with stainless steel set screw.

2.10 PRE-FORMED INSULATED PIPE WRAP KIT (T-13): Provide pre-molded closed cell antimicrobial vinyl, 1/8" wall thickness, lavatory piping guard protection. Lavatory p-trap and angle valve assemblies shall all be insulated. Provide flap-cap access cover at angle stop. Provide pipe guard protection for all plumbing piping at lavatories.

PART 3 - EXECUTION

3.1 INSPECTION: Installer must examine the areas and conditions under which toilet accessories are to be installed. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.2 INSTALLATION: Install with concealed mounting devices and fasteners fabricated of the same material as the accessories, or of galvanized steel, as recommended by manufacturer. Secure toilet room accessories to adjacent walls and partitions complying with the manufacturer's instructions for each item and each type of substrate construction.

END OF SECTION 108000

SECTION 122124 - MANUAL ROLLER SHADE SYSTEM

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Manually operated sunscreen shades.

1.2 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
   3. Storage and handling requirements and recommendations.
   4. Mounting details and installation methods.

B. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances and relationship to adjacent work.
   1. Include coverage patterns and physical dimensions of each item.

C. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.

D. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shade cloth samples and aluminum finish sample as selected. Mark face of material to indicate interior faces.

E. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

F. Warranty: Provide manufacturer's warranty documents as specified in this Section.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades system through one source from a single manufacturer with a minimum of ten years' experience manufacturing products comparable to those specified in this section. This includes, but is not limited to, all required extrusions, accessories and fabricated roller shades.

B. Fire-Test-Response Characteristics: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

C. Shadecloth Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, and ATCC9645.

D. Mock-Up: Provide a mock-up of one roller shade assembly for evaluation of mounting, appearance and accessories.
   1. Locate mock-up in window designated by Architect.
   2. Do not proceed with remaining work until mock-up is accepted by Architect.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver components in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.6 WARRANTY

A. Warranty: Provide manufacturer's standard warranties, including the following:
   1. Roller Shade Hardware, and Shadecloth: Manufacturer's standard non-depreciating twenty-five-year limited warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Basis of Design Manufacturer for Window Shade System: Products by MechoSystems; 42-03 35th Street, Long Island City, NY 11101.

2.2 SHADE BANDS

A. Shade Bands: Construction of shade band includes the fabric, the enclosed hem weight, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
   1. Concealed Hembar: Shall be continuous extruded aluminum for entire width of shade band and with the following characteristics:
      a. Hembar shall be heat sealed on all sides.
      b. Open ends shall not be accepted.
   2. Shade Band and Shade Roller Attachment:
      a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection.

b. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a “snap-on” snap-off” spline mounting, without having to remove shade roller from shade brackets.
c. Mounting Spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
d. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets, does not meet the performance requirements of this specification and shall not be accepted.

2.3 ROLLER SHADE FABRICATION

A. Fabricate shade cloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch in either direction per 8 feet of shade height due to warp distortion or weave design.

B. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shade bands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer’s standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

2.4 ROLLER SHADE COMPONENTS

A. Access and Material Requirements:
1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.

B. Manually Operated Chain Drive Hardware and Brackets:
1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
3. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
4. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to

manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.

5. Provide shade hardware system that allows multi-banded manually operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
6. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable.
7. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
8. Drive Bracket / Brake Assembly:
    a. MechoShade Drive Bracket model M5 shall be fully integrated with all MechoShade accessories, including, but not limited to: SnapLoc fascia, room darkening side / sill channels, center supports and connectors for multi-banded shades.
    b. M5 drive sprocket and brake assembly shall rotate and be supported on a welded 3/8-inch steel pin.
    c. The brake shall be an over running clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. in the stopped position.
    d. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
    e. The entire M5 assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
9. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.

2.5 ROLLER SHADE SCHEDULE

A. Roller Shade Schedule: Refer to the Drawings for locations.
    1. Shade Type WT-1: Manual operating, chain drive, sunscreen roller shades in all exterior windows of rooms and spaces shown on the Drawings.

2.6 SHADECLOTH

A. Visually Transparent Single-Fabric Shadecloth: MechoSystems, ThermoVeil® group, single thickness, opaque non-raveling 0.030-inch thick vinyl fabric, woven from 0.018-inch diameter extruded vinyl yarn comprising of 21 percent polyester and 79 percent reinforced vinyl, in colors selected from manufacturer's available range.

1. Dense Linear Weave: “1000 series”, 3 percent open, dense linear-weave pattern.
2. Color: Selected from manufacturer’s standard colors.

2.7 ROLLER SHADE ACCESSORIES

A. Fascia:
1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
2. Fascia shall be able to be installed across two or more shade bands in one piece.
3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION OF ROLLER SHADES

A. Contractor Furnish and Install Responsibilities:
1. Window Covering Contractor (WC) shall provide an on site, Project Manager, and shall be present for all related jobsite scheduling meetings.
2. WC shall supervise the roller shade installation and setting of intermediate stops of all shades to assure the alignment of the shade bands within a single EDU group, which shall not exceed +/- 0.125 inches, and to assure the alignment between EDU groups, which shall not exceed +/- 0.25 inches.
3. WC shall be responsible for field inspection on an area-by- area and floor-by-floor basis during construction to confirm proper mounting conditions per approved shop drawings.
4. Verification of Conditions: examine the areas to receive the work and the conditions under which the work would be performed and notify General

Contractor and Owner of conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected. Commencement of installation shall constitute acceptance of substrate conditions by the installer.

5. WC shall provide accurate to 0.0625 inch; field measurements for custom shade fabrication on the Roller Shades manufacturers input forms.
6. WC Installer shall install roller shades level, plumb, square, and true according to manufacturer's written instructions, and as specified here in. Blocking for roller shades installed under the contract of the interior General Contractor shall be installed plumb, level, and fitted to window mullion as per interior architect's design documents and in accordance with industry standard tolerances. The horizontal surface of the shade pocket shall not be out-of-level more than 0.625 inch over 20 linear feet.
7. Shades shall be located so the shade band is not closer than 2 inches to the interior face of the glass. Allow proper clearances for window operation hardware.
8. Adjust, align and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
9. Installer shall set Upper, Lower and up to 3 intermediate stop positions of all motorized shade bands and assure alignment in accordance with the above requirements.
10. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
11. WC shall train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.
12. Protect installed products until completion of project.
13. Touch-up, repair or replace damaged products before Substantial Completion.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 122124

SECTION 123661 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid surface material countertops.
2. Solid surface material backsplashes.

1.2 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

C. Samples: For each type of material exposed to view.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.

1. Type: Provide Standard type.
2. Colors and Patterns: As selected by Architect from manufacturer's full range.

B. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.

C. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 COUNTERTOP FABRICATION

A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."

1. Grade: Custom.

B. Configuration:

1. Front: 1-1/2-inch laminated bullnose
2. Backsplash: Radius edge with 3/8-inch radius.
3. End Splash: None.

C. Countertops: 3/4-inch thick, solid surface material with front edge built up with same material.

D. Backsplashes: 3/4-inch thick, solid surface material.

E. Joints: Fabricate countertops without joints.

F. Cutouts and Holes:

1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

2.3 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.

B. Sealant for Countertops: Comply with applicable requirements in Section 079200, "Joint Sealants."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer.

B. Install backsplashes and end splashes by adhering to countertops with adhesive.

C. Install aprons to backing and countertops with adhesive.

D. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

E. Apply sealant to gaps at walls; comply with Section 079200, "Joint Sealants."

END OF SECTION 123661

SECTION 312300 - EARTHWORK FOR STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY

A. This section covers excavating, filling and backfilling for buildings and structures. Work under this Section extends to a point 5 feet (unless noted otherwise on drawings) beyond the enclosing walls or foundations of appurtenances of a building or structure.

B. Material Classification - All material excavated shall be defined as “unclassified excavation”, regardless of the nature of the material.

When unsuitable material is encountered at design subgrade elevation, the unsuitable materials shall be undercut under the directions of a Geotechnical Engineer and backfilled with compacted structural fill to original design subgrade elevation.

No compensation will be given due to over excavation of the Contractor's fault.

C. Test borings or other exploratory operation may be made by the Contractor at his expense.

D. During the life of the Contract, utility lines constructed shall be protected from damage.

1.3 SUBMITTALS

A. Submit three (3) copies of the following reports directly to the Architect/Engineer from the Geotechnical Engineer and testing laboratory.

1. Test report on borrow material.

2. Verification of foundation subgrade (rock when applicable) by a registered Geotechnical Engineer.

3. Compaction test reports

4. Any additional exploration for sinkhole activity.

5. Test Report on structural fill.

All test reports and correspondence shall bear the approved Geotechnical Engineers seal and signature.

1.4 QUALITY ASSURANCE

A. The Contractor shall employ a Geotechnical Engineer and testing laboratory licensed to practice in the Commonwealth of Virginia and acceptable to the Architect/Engineer to perform soils testing and inspection service for quality control.

B. All excavations shall conform to current applicable OSHA regulations.

C. Dewatering operations shall conform to all applicable regulations.

PART 2 - PRODUCTS

2.1 DEFINITIONS

A. Satisfactory Soil shall be determined by the registered Geotechnical Engineer.

B. Compacted Structural Fill and backfill material shall be considered suitable when it conforms to the following requirements unless specified otherwise on the plans or in the specifications (as determined by the Geotechnical Engineer).

- -- Classify as SC, SM, SP, SW, GC, GM, GP, GW in accordance with ASTM D-2487.
- -- Less than 25 percent by weight passing the No. 200 sieve.
- -- Maximum Particle Diameter of 3 inches.
- -- Shall be compacted to at least 95 percent of maximum dry density per ASTM D-1557, Modified Proctor.
- -- Shall be free of waste, frozen materials, vegetation and other deleterious matter.

C. Suitable Natural Soil - Suitable natural soil is that subgrade which has been determined by the Geotechnical Engineer to be capable of the bearing pressures given on drawings and also determined to be acceptable for further construction by the Geotechnical Engineer.

D. Volume of Unsuitable Subgrade Material - Shall be defined as the volume of the material in place below design subgrade elevation prior to disturbance or removal.

E. Drainage Fill Material - (Crushed stone or gravel) - Washed uniformly graded mixture of crushed stone with 100% passing a 1-1/2" sieve and not more than 5% passing a No. 4 sieve.

F. Lean Concrete Fill - Concrete with 2500 psi (min) 28-day compressive strength, and meeting requirements of Concrete Section of these Specifications.

PART 3 - EXECUTION

3.1 SURPLUS SOILS/UNSUITABLE SOILS

A. Surplus soils or unsuitable soils from excavation on the site shall be disposed of at waste areas arranged by the Contractor and approved by the Architect/Engineer. Adequate siltation and erosion control as determined by the authority having jurisdiction, shall be provided at the disposal site, as well as revegetation where required.

B. Void, Cavities - Where voids or cavities are encountered at subgrade elevation, fill the voids or cavities with lean concrete or controlled fill as directed by the Geotechnical Engineer.

3.2 EXCAVATION

A. Design subgrade elevation is defined as the bottom (bearing) elevation for footings, mat foundations, and caissons for structures and the bottom of concrete "turndown" or bottom of base aggregate (whichever is lower) for concrete slabs and grade beams on base aggregate.

B. The excavation shall conform to the dimensions and elevations indicated on the Plans for each building and structure and shall include trenching for drainage systems occurring within the enclosing walls or appurtenances of the building structures, and to a point 5 feet (unless noted otherwise on the drawings) beyond the building line of each building and/or structure. In areas where the proximity of the structures and buildings is such that it would be impractical to excavate for the individual structures and buildings, the entire area may be excavated to the required depth as indicated on the Plans and a safe, stable slope shall be constructed to the ground surface.

C. Drainage - Excavation shall be performed under dry conditions. The excavation and the area immediately surrounding each excavation for a distance of 25 feet, including slopes and ditches, shall be continually and effectively drained away from the excavation. The excavation for inlet, outlet, and diversion ditches, and the furnishing and operating of dewatering equipment, as necessary, shall be performed as indicated elsewhere in these Specifications. Suitable precautions shall be taken to prevent any erosion from undercutting previously concreted footings and slabs. Excavations shall be kept free from ponding until the permanent work in the excavations has been completed and accepted, and the excavations have been completely backfilled.

D. Sheeting, shoring and underpinning, including steel sheet piling, shall be installed during excavation, where required for protection of workmen, tanks, adjacent paving, structures and utilities as shown on Plans, or as required by the Architect/Engineer.

E. Buildings and Structures - Excavation shall extend a sufficient distance from walls and footings, to maintain for placing and removing shoring and forms, to ensure the performance of all work in the excavations, and to allow inspection of the work, except where the concrete for walls and footings is authorized by the Architect/Engineer to be deposited directly against excavated surfaces.

F. Minimum allowable bearing pressures shall be as noted on the drawings.

G. Where the excavation is made below the elevations indicated on the Plans due to the fault of the Contractor, the over excavation shall be filled as specified in Paragraph 3.5, "Fill" and with material as described in this section, as directed by the Geotechnical Engineer. No additional payment will be made to the Contractor for over excavating and filling.

H. All topsoil and unsuitable natural soils at design subgrade elevation shall be undercut based on the observations of the Geotechnical Engineer. The area so excavated shall be filled with Compacted Structural Fill to original design subgrade elevation. In addition, shallow hand anger probes shall be excavated by the Geotechnical Engineer in natural soils at the design subgrade elevation to ensure that no rock exists within one foot below the design subgrade elevation. Rock existing above this level shall be removed and replaced with fill as described above.

I. Observation of subgrades, rock and soil cut and fill slopes and testing of the compacted fill shall be carried out by the Geotechnical Engineer to determine that satisfactory soils are present and that compacted fill has been adequately placed.

J. PROOFROLLING - All subgrades below structures and areas to receive compacted fill shall be proofrolled with tandem - axle dump truck. Proofrolling shall be carried out under the inspection of the Geotechnical Engineer to verify that unsuitable material is not present. Where proofrolling reveals weak unsuitable material, under cut and replace with structural fill under the direction of the Geotechnical Engineer.

K. PROTECTION OF SUBGRADE - Site drainage shall be provided to maintain subgrades free of water and to avoid saturation and disturbance of the subgrade soils prior to pouring foundations or placing fill. Any subgrade soils which have been weakened due to saturation and disturbance shall be removed and replaced with compacted fill at the Contractor's expense.

L. EXCAVATION ADJACENT TO EXISTING FOOTINGS - During excavation adjacent to existing footings, the Contractor shall provide temporary shoring and/or incrementally excavate and backfill in short segments or use other approved means to insure that lateral or vertical movement of the existing footings and walls is prevented. In no case shall the Contractor undermine or disturb soil beneath the existing foundations.

M. BLASTING – Blasting is not allowed on this project.

N. Required Overexcavation - Where rock is encountered at design elevation, overexcavate a minimum of 1'-0", backfill with controlled fill under grade beams and slab to act as a cushion between the foundations and rock.

O. Removal of Rock where Encountered - The Contractor will be compensated for the removal of rock above design subgrade elevations at the “Rock Excavation” bid unit price.

P. Excavation for Piping within Building Areas - Dig trenches to the uniform width required for the particular item to be installed, sufficiently wide to provide ample working room.

Excavate trenches to the depth indicated or required. Beyond the building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze-ups.

Trenches for underground utilities and drainage lines shall be excavated to the required depths. The bottoms of trenches shall be graded to secure the required fall for pipelines. Where wet or otherwise unstable material is incapable of properly supporting the pipe or utility line, (as determined by the Geotechnical Engineer) encountered in the bottom of the trench, such soil shall be removed to firm bearing. Over depth excavation shall be performed for the full width of the trench, and the backfilled to the proper grade and compacted in accordance with Backfilling or this Specification. Pipe beds shall be rounded to accommodate the bottom quadrant of pipes, and bell holes shall be excavated so that pipe will be uniformly supported for its entire length. Pipe beds shall be taped when necessary to provide uniform, firm support.

Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for the entire body of the pipe.

3.3 FILL

A. Minimum allowable bearing pressures shall be as noted on the drawings.

B. SLABS-ON-GRADE - Slabs-on-grade shall be supported on suitable natural soil or compacted structural fill. Recompact slab subgrades immediately prior to placing moisture barrier materials as described below.

A 4 inch (minimum) moisture barrier consisting of VDOT No. 57 stone shall underlie all floor slabs on grade. Compact aggregate with at least 2 passes with suitable vibratory compaction equipment. Floor slab subgrades shall be proofrolled to meet the requirements set forth herein.

C. Compacted Structural Fill shall extend at least 10 feet beyond the limits of the structures where slope is steeper than 1.5H:1V to meet existing grades. Fill shall extend a minimum of 5 feet horizontally beyond structures when slopes are 3H:1V or flatter.

D. Fill shall be provided where required to raise the subgrade to the elevations shown on the Plans. The material used, the maximum thickness of each layer prior to compaction, and the percent of maximum density required at optimum moisture content shall be as stated in this Section. Fill material shall meet the requirements set forth in Paragraph 2.1. No fill shall be placed until the subgrade has been checked and approved, and in no case shall fill be placed on a subgrade that is muddy, frozen, or that contains frost. Each layer shall be uniformly spread, moistened, or dried by aeration, when required, to within 3% of the optimum moisture content for the required degree of compaction, and uniformly compacted by approved equipment. the surface, presented by the completed fill shall be brought to a reasonably true and even plane, and shall be approved by the Architect/Engineer prior to further construction operations thereon.

E. Borrow - Where satisfactory materials are not available in sufficient quantity from required excavations, materials approved by the Architect/Engineer and the Geotechnical Engineer shall be obtained from borrow areas. No separate payment will be made for furnishing and placing approved borrow material. Compensation in full is included in the lump sum price paid under this Contract. All soil materials brought on-site shall be tested and certified as suitable by the Geotechnical Engineer prior to use. Adequate siltation and erosion control, as determined by the authority having jurisdiction, shall be maintained at the borrow site, as well as revegetation where required, at no additional cost to the Owner.

F. Placing - The approved materials shall be placed in the successive horizontal layers of loose material not more than 8 inches in loose thickness where compaction is by rollers or vibrators and 4 inches thick where mechanical tamping is required. During fill placement, density tests shall be performed, at regular intervals, (one per lift) by a qualified soil technician.

G. Compaction - Where gravel is used for fill, the material shall be compacted to maximum possible density obtainable with a plate-type vibrating compactor of standard manufacture consisting of a variable speed power unit attached to a vibratory plat. The vibrator may be single or multiple type and shall provide sufficient unit pressure on the vibratory plate to obtain maximum density. Upon completion of the subgrade, the applicable moisture density relations shall be maintained until placement of the concrete.

H. Any subgrade soils which have been weakened due to saturation or disturbance should be recompacted or removed and replaced as recommended by the Geotechnical Engineer.

I. Prior to concrete placement, remove all loose or soft soils from bottom of excavation. Place concrete on the same day as excavation of foundations.

J. Moisture Control - Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.

Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value outlined above.

3.4 BACKFILLING - Backfilling shall be performed after the permanent work in the excavation has been inspected and approved by the Architect/Engineer. Shoring, including sheet piling, shall be removed in a manner to avoid damage or disturbance to the work, and the excavations shall be free of forms and cleaned of trash. The material used and the maximum thickness of each layer prior to compaction shall be stated in Paragraph 3.3 "Fill", of this Section. Backfill shall not be placed on surfaces that are muddy, frozen, or contain frost. Backfill shall be brought to final grade unless otherwise shown or specified and shall be brought up evenly on each side of each wall and pipe. Care shall be exercised to avoid any wedging action or eccentric action upon or against the structure, and to avoid any disturbance or damage to the work. Each layer shall be uniformly spread, moistened or dried by aeration, when required, to within 3% of the optimum moisture content for the required degree of compaction, and uniformly compacted by hand or machine tampers or by other suitable equipment. Heavy equipment for spreading and compacting backfill shall not be operated closer to the wall than a distance equal to the height of the backfill above the top of footing or as noted on the drawings. Compaction equipment used adjacent to the walls shall not exceed 3000 pounds static weight. Backfill shall be brought to a suitable elevation above grade to provide for anticipated settlement and shrinkage thereof. Backfill shall not be placed against foundation walls prior to 28 days after completion of wall construction and then only after approval by the Architect/Engineer.

3.5 GRADING - Areas required to be graded outside of each building and structure line shall be constructed true to grade, shall be shaped to drain, and shall be maintained free from extraneous accumulations until final inspection has been completed, and the work has been accepted.

END OF SECTION 312300

SECTION 312500 - EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 This Section shall consist of temporary control measures as directed by the Architect or the Owner's construction representative during the life of the Contract to control erosion and water pollution through the use of berms, dikes, dams, sediment basins, fiber mats, netting, mulches, grasses, slope drains, temporary silt fences, and other control devices.

1.2 This work shall be performed in accordance with the erosion and sediment control plan narrative and the details provided therein, and as described, detailed and required by the Virginia Department of Conservation and Recreation's Division of Soil and Water Conservation's most recent edition of the Virginia Erosion and Sediment Control Handbook.

1.3 The temporary pollution control provisions contained herein shall be coordinated with the permanent erosion control features, to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.

1.4 It shall be the Contractor's responsibility to meet the requirements of installing and maintaining adequate erosion and sediment control measures to protect all disturbed and adjacent areas from erosion during the term of the construction contract. The Contractor shall install and maintain those measures required by the Architect or Building Official.

PART 2 - PRODUCTS

2.1 The Contractor shall install and maintain the following erosion and sediment control measures as applicable (all measures are to be implemented as described in the Virginia Erosion and Sediment Control Handbook):

2.2 TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/ EXIT (VESCH PRACTICE 3.02) – A temporary gravel construction entrance shall be constructed at any equipment/materials storage areas used by the Contractor. Additional construction entrances shall be installed as required during construction. The temporary construction entrance shall be a minimum of 70 ft. long by 12 ft. The construction entrance shall be maintained in a condition that will prevent tracking or flow of mud onto public roads.

2.3 TEMPORARY SILT FENCE (VESCH PRACTICE 3.05) - Temporary silt fence shall be used downgradient of all fill slopes and as needed to control runoff in ditches. Silt fence is temporary and shall be removed as directed by the Engineer upon establishment of suitable stabilization.

2.4 STORM DRAIN INLET PROTECTION (VESCH PRACTICE 3.07) – Block and gravel inlet protection shall be used to prevent sediment from entering the existing and proposed inlets within the project area.

2.5 CULVERT INLET PROTECTION (VESCH PRACTICE 3.08) – Culvert inlet protection shall be used for any existing and/or proposed culverts within the project area and shall be inspected after each rain and repaired as needed.

2.6 DIVERSION (VESCH PRACTICE 3.12) – Permanent diversion channels shall be constructed upgradient of the proposed building pad cut slope prior to excavating the slope. The diversions

shall be used to prevent off-site stormwater from eroding the cut slope. All segments of the diversion in excess of 10% slope shall be protected with stabilization matting.

2.7 TEMPORARY SEDIMENT TRAP (VESCH PRACTICE 3.13 – Temporary sediment traps shall be constructed as shown on the plans to accept runoff from larger disturbed areas. The traps shall be cleaned as needed.

2.8 CULVERT OUTLET PROTECTION (VESCH PRACTICE 3.18) – Riprap shall be used for culvert outlet protection as shown on the plan sheets. Additional riprap may be required if scouring occurs.

2.9 ROCK CHECK DAM (VESCH PRACTICE 3.20) – Rock check dams may be required to prevent erosion of roadside ditches with slopes greater than 8% and in any other locations where scouring occurs. The check dams are temporary and shall be removed once the ditches are stabilized.

2.10 TEMPORARY SEEDING (VESCH PRACTICE 3.31) - All areas of disturbed vegetation shall be restored. Those disturbed areas which will not be brought to final grade within 30 days following disturbance shall be temporarily seeded.

2.11 PERMANENT SEEDING (VESCH PRACTICE 3.32) –All disturbed areas not permanently stabilized with gravel or pavement shall have permanent seeding. Permanent stabilization shall include permanent seeding as necessary to establish a stand of vegetation that will adequately protect disturbed areas from erosion. Disturbed areas may require seeding more than once to establish adequate ground cover.

2.12 MULCHING (VESCH PRACTICE 3.35) - All disturbed areas to be revegetated shall also be mulched with straw or other suitable material to protect the ground surface until vegetation is established.

2.13 SOIL STABILIZATION BLANKETS AND MATTING (VESCH PRACTICE 3.36) – Temporary lining shall be used to prevent erosion in roadside ditches as required if erosion begins to occur to promote vegetation of the ditches. The type of ditch linings shall be jute mesh or equal. Soil stabilization matting is also required on all cut/fill slopes in excess of 10%.

2.14 DUST CONTROL (VESCH PRACTICE 3.39) - The Contractor shall take measures as necessary to minimize the amount of airborne dust caused by construction. Areas of particular concern include work areas adjacent to roadways and existing structures. The preferred methods of dust control include irrigation, application of crushed stone, and application of mulch (outside of traffic areas).

2.15 CLEANING OF ROADWAYS - The Contractor shall take measures as necessary to minimize the amount of dust, sediment, and/or mud on paved roads, parking lots, and driveways. Where practical, excavated material shall not be placed on these paved surfaces. When necessary to place excavated material on paved surfaces, a layer of crushed rock dust shall first be applied. Following completion of work in that area, the excavated material shall be removed and the pavement swept and/or washed. On gravel roads, parking lots, and driveways, a new surface of crushed stone shall be applied following construction to cover any residual excavated material.

2.16 CONCRETE WASHOUTS- The Contractor shall direct concrete wash water into a leak-proof container or leak-proof settling basin. The container or basin shall be designed so that no overflows can occur due to inadequate sizing or precipitation. Hardened concrete wastes shall be removed

and disposed of in a manner consistent with the handling of other construction wastes. Liquid concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wash waters and shall not be discharged to surface waters.

PART 3 - EXECUTION

3.1 PROJECT REVIEW - During the pre-construction conference, the Contractor shall meet with the Architect and go over in detail the expected problem areas in regard to the erosion control work. Different solutions should be discussed so that the best method might be determined. It is the responsibility of the Contractor to implement erosion control measures acceptable to the Architect.

No work shall be started until the erosion control measures have been implemented and accepted by the Architect.

All disturbed areas that have no construction activity in proximity shall be temporarily seeded within 30 days of completion of the disturbing activities.

All siltation and erosion control devices installed during the course of construction shall be maintained in proper working order at all times, and shall not be removed until final stabilization of all disturbed areas or at the direction of the Architect.

3.2 CONSTRUCTION REQUIREMENTS - The Architect has the authority to limit the surface area of erodible earth material exposed by construction and to direct the Contractor to provide immediate permanent or temporary control measures to prevent erosion.

The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practical time as outlined in his accepted schedule. Temporary pollution control measures shall be used to correct conditions that develop during construction that were not foreseen during the design state; that were needed prior to installation of permanent pollution control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project. All erosion control measures shall be constructed in accordance with the Virginia Erosion and Sediment Control Handbook.

The Architect reserves the right to limit the area of construction in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding and other such permanent erosion control measures current in accordance with the accepted schedule.

3.3 MAINTENANCE - The temporary erosion control features installed by the Contractor shall be acceptably maintained by the Contractor until no longer needed or permanent erosion control methods are installed. Any materials removed shall become the property of the Contractor.

In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of work as scheduled, and are ordered by the Architect, such work shall be performed by the Contractor at his own expense.

Erosion Control Outside Project Area - Temporary pollution control shall include construction work outside the project area where such work is necessary because of construction such as borrow pit operations, haul roads, and equipment storage sites.

3.4 VIRGINIA STORMWATER MANAGEMENT PERMIT REQUIREMENTS - Following project bidding but prior to start of construction, the Contractor will submit to DEQ the VSMP General Permit Registration Statement in order to secure a Stormwater General Permit for the project. The Contractor shall be designated as the Construction Activity Operator under the Permit. As such, the Contractor shall be responsible for all recordkeeping, reporting, and other actions required by the Stormwater Pollution Prevention Plan and the Stormwater General Permit.

END OF SECTION 312500

SECTION 312600 - EXCAVATION AND BACKFILLING FOR UTILITIES

PART 1 - GENERAL

1.1 SCOPE - This section covers the excavation and backfill for all water, sanitary sewer, and storm sewer pipelines.

PART 2 - MATERIALS

2.1 INITIAL BACKFILL - Initial backfill is defined as that material placed from the bottom of the trench excavation to the minimum required depth over the top of the pipe, as shown on the standard detail plan sheets. Initial backfill shall be consolidated using a hand operated vibratory compactor. Initial backfill material is classified based upon the Unified Soil Classification System (USCS). The soil classifications are defined as follows:

USCS Soil Classification System (FHA Bulletin No. 373) as shown on the Plans.

Class I - Angular, crushed (1/4 to 1 inch)

Class II - Coarse sands and gravel with maximum particle size of 25 mm (1 inch) including variously graded sands and gravel containing small percentages of fine, generally granular and non-cohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class.

Class III - Fine sand and clayey gravel less than 1 inch, including fine sands, sand-clay mixtures, and gravel-clay mixtures. Soil types GM, GC, SM, and SC are included in this class.

2.2 FINAL BACKFILL - Final backfill is that material placed from the top of the initial backfill to the top of the trench. In general, material excavated from the trench may be used as final backfill with the following exceptions:

1. Unsuitable soils shall not be used for final backfill. Unsuitable soils include mud, muck, organic matter, and construction debris.

2. Rock over 5" in size shall not be used for final backfill.

3. In paved areas which are to be repaved following pipeline construction, trench backfill shall be Class I, full depth.

PART 3 - EXECUTION

3.1 EXCAVATION

3.1.1 General - All excavation shall be open-cut unless designated otherwise on the plans. All excavation shall be unclassified, except that rock and/or unsuitable materials encountered in pipe trenches shall be paid for at the respective bid unit prices for those materials. The cost for excavation shall be included in the contractor's bid for pipeline as no separate payment will be made for excavation. It is the Contractor's responsibility to determine what protective measures (shoring, sheet piling, trench box, etc.) are required to execute the work and provide safety to the workers and the public.

3.1.2 Trench Excavation - Trenches for pipeline utilities are to be excavated by the Contractor using equipment/procedures necessary to complete the work. Trench width shall be as required to meet the minimum pipe bedding requirements shown on the plan sheets and/or VDOT specification, and to comply with OSHA safety requirements. Trenches are to be excavated to the design grade depth and width. Minimum trench width for all pipelines 2 inches and larger shall be no less than the outside diameter of the pipe plus 8 inches. Small diameter (1" and smaller) water service lines may be installed using a narrower trench width. It is the Contractor's responsibility to excavate trenches at the design depth. Overexcavation shall be replaced with suitable compacted fill material at the Contractor's expense. In no case shall pipe bear upon bedrock in the trench. When the utility trench lies in bedrock, the trench shall be over-excavated a minimum of 6" below the design grade and backfilled to the design grade with crushed stone. In locations where the excavated trench is unsuitable to support the pipe due to wet or unstable material, the unsuitable material shall be removed and replaced with suitable material. The cost for all trench rock and/or unsuitable materials excavation and replacement shall be paid for at the Contractor's unit bid price for those materials.

3.1.3 Pipe Bedding - Bedding requirements for pipelines are dependent upon the type of pipe material utilized. Bedding requirements shall be as follows:

A. PVC Pipeline Material - Bedding for all material lines (gravity or pressure) shall be a minimum of Class B as described in ASCE Manual No. 37 and as shown on the standard detail plan sheets - unless otherwise specified.

B. Metal Pipeline Material (Ductile Iron, steel, copper) - Bedding for all metal material lines (gravity or pressure) shall be a minimum of Class C as described in ASCE Manual No. 37 and as shown on the standard detail plan sheets - unless otherwise specified.

C. Reinforced Concrete Pipeline Material - Bedding for all reinforced concrete material lines (gravity or pressure) shall be a minimum of Class C as described in ASCE Manual No. 37 and as shown on the standard detail plan sheets - unless otherwise specified.

D. Exceptions - The bedding requirements and bedding details as specified herein and as shown on the standard detail plan sheets have been developed to cover most situations. There may be instances when more or less stringent bedding requirements are warranted. In these special cases, the Engineer and Contractor shall work together to resolve a mutually agreeable solution.

3.2 BACKFILLING - Trenches shall be backfilled as the work progresses. No more than 500 linear feet of trench shall be open at any time. All trenches shall be backfilled at the end of the workday as exposed trenches shall not be left unattended. Initial backfill material shall be Class I, II, or III material as defined in Section 2.1 and as shown on the standard detail plan sheets. Final backfill material shall generally consist of that material excavated from the trench except that unsuitable materials shall not be used. Unsuitable final backfill material would include mud, stumps, organic matter, trash, frozen material, or rock larger than 5". All backfill materials shall contain a moisture content that will facilitate compaction. The initial backfill shall be brought up in layers not exceeding 6 inches in compacted depth for the full length of pipe. Each layer shall be thoroughly compacted by hand operated tamping equipment. The remainder of the trench shall be backfilled. Final backfill shall be brought up and compacted in layers not exceeding 8 inches. Backfill in open areas shall be compacted to a density equal to that of the existing ground. Backfill under roadways or other areas subjected to vehicular traffic shall be compacted to a minimum density of 95 percent of maximum density. It is the Contractor's responsibility to dispose of excess trench excavation

material in a lawful acceptable manner. It is the Contractor's responsibility to repair any backfill settlement which occurs during the term of the construction contract and warranty period.

3.3 FILL - Fill material shall be provided where required to raise the subgrade to the elevations shown on the plan sheets or to replace unsuitable materials. Fill material placed below the design subgrade elevation shall comply with the requirements for initial backfill material. Fill material placed above the design subgrade elevation shall comply with the requirements for final backfill material. Fill material shall be free of trash, roots, organic matter or frozen materials. No fill shall be placed on muddy or frozen ground. Fill material shall be placed in successive 6" vertical lifts and compacted until the desired grade is achieved.

3.4 BORROW - When satisfactory material is not available from required trench excavations, the Contractor shall obtain suitable borrow material. It is the Contractor's responsibility to locate suitable borrow site(s) and to restore the property to the satisfaction of the property owner when complete. No separate payment will be made for furnishing and placing borrow material as the cost for borrow material is to be included in the Contractor's bid for pipe installation.

3.5 CONCRETE ENCASEMENT - Where called for on the plan sheets, pipe shall be concrete encased. Concrete used for concrete encasement shall have a minimum 28-day compressive strength of 2500 psi. Concrete used for crossings designated as "river crossing" shall include reinforcing steel. The dimensions of the encasement shall conform to the dimensions shown on the plans. No concrete shall be placed directly in water. The Contractor shall not backfill over concrete encasement until 24 hours after pouring, unless directed otherwise by the Engineer. Concrete encasement will be paid for using a linear foot unit price.

3.6 BLASTING – Not allowed in this project.

3.7 AGGREGATE AND PAVING - All open cuts through pavement shall be backfilled with crushed stone. Paved public roadways shall be repaved using asphalt base course (greater of 3" or 1.5x existing thickness) and asphalt surface (greater of 2" or existing thickness). Disturbed gravel roads, driveways and shoulders shall be replaced with aggregate stone a minimum depth of six inches or equal to the original thickness, whichever is greater. Existing paved driveways that are disturbed shall be repaved to original thickness using local plant mix asphalt.

END OF SECTION 312600

SECTION 313116 – TERMITE CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2 SUMMARY: Provide soil treatment for termite control, as herein specified.

1.3 SUBMITTALS: Product Data: Submit manufacturer's technical data and application instructions for Architects approval.

1.4 QUALITY ASSURANCE

A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for work and application.

B. Engage a professional pest control operator, licensed in the Commonwealth of Virginia, in accordance with regulations of governing authorities for application of soil treatment solution.

C. Use only termiticides which bear a Federal registration number of the U.S. Environmental Protection Agency.

1.5 JOB CONDITIONS

A. Restrictions: Do not apply soil treatment solution until excavating and filling are completed, except as otherwise required in construction operations.

B. To insure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

1.6 SPECIFIC PRODUCT WARRANTY

A. Furnish written warranty certifying that applied soil termiticide treatment will prevent infestation of subterranean termites and, that if subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation at no cost to the Owner. Provide warranty for a period of 5 years from date of treatment, signed by Applicator and Contractor.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT SOLUTION

A. Use an emulsible concentrate termiticide for dilution with water, specially formulated to prevent infestation by termites. Fuel oil will not be permitted as a diluent. Provide a solution consisting of one of following chemical elements and concentrations:

1. Chloropyrifos ("Dursban TC"); 1.0 percent in water emulsion.

2. Permathrin ("Dragnet", "Torpedo"); 0.5 percent in water emulsion.

B. Other solutions may be used as recommended by Applicator if also acceptable to the Architect and approved for intended application by jurisdictional authorities. Use only soil treatment solutions which are not injurious to planting.

PART 3 - EXECUTION

3.1 INSPECTION: Applicator must examine the areas and conditions under which soil treatment for termite control is to be installed. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Applicator.

3.2 APPLICATION

A. Surface Preparation: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if acceptable to the Architect.

B. Application Rates: Apply soil treatment solution as follows:

1. Within building area, under slabs-on-grade, at the rate of 1 gal. per 10 sq. ft.

2. Under foundations and footings, including horizontal and vertical surfaces of excavations, at the rate of 1 gal. per 10 sq. ft.

3. Outside building perimeter in a strip at least 10' wide, and under porches, areaways, aprons, pads, or paved extensions, at a rate of 1 gal. per 5 sq. ft.

4. At pavement structures, limit treatment under pavement to a 2' wide strip adjacent to structure, at the rate of 1 gal. per sq. ft.

5. In absorbent soil or fill (sand, sand and gravel mix, etc.) increase the application rate to 1-1/2 gal. per 10 sq. ft. where 1 gal. per 10 sq. ft. is specified.

6. At hollow masonry foundations or grade beams, treat voids at the rate of 1 gal. per 5 lin. ft., poured directly into the hollow spaces.

C. Allow not less than 12 hours for drying after application, before beginning concrete placement or other construction activities.

D. Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.

E. Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

END OF SECTION 313116

SECTION 321000 - ROADWAY AND PARKING LOTS

PART 1 - GENERAL

1.1 This section details all necessary excavation, backfill, subbase, paving, sidewalks and curb and gutter installation to the lines and grades as shown on the construction drawings. All construction shall conform to the most recent edition of the Virginia Department of Transportation Road and Bridge Specifications and Road Designs and Standards.

1.2 MATERIAL CLASSIFICATION - All material excavated shall be defined as "unclassified excavation". Unclassified excavation includes the required undercut excavation, or unsuitable soil excavation.

PART 2 - PRODUCTS

2.1 Street Subbase and Base - The street subbase and base shall confirm with Section 208, 308, 309 and any applicable sections as stated in the V.D.O.T. Road and Bridge Specifications to the compacted thicknesses shown on the typical cross sections on the construction drawings. All subbase and base material shall be compacted to 100% of the theoretical maximum density as determined by ASTM D-698, within plus or minus 3% of optimum moisture for the full width of the cross section.

2.2 PRIME COAT - The prime coat shall conform to Section 311 and any applicable sections as stated in the V.D.O.T. Road and Bridge Specifications.

2.3 Bituminous Concrete Paving - The bituminous concrete paving shall conform with Section 211 and any applicable sections as stated in the V.D.O.T. Road and Bridge Specifications, the type and the compacted thicknesses specified on the typical sections of the construction drawings.

2.4 Concrete - The concrete shall conform with Section 404 and any applicable sections as stated in the V.D.O.T. Road and Bridge Specifications.

PART 3 - EXECUTION

3.1 The execution for construction shall be in accordance with Sections 1A of these specifications.

3.2 Testing and Inspection Services - The Contractor, at the Contractor's expense, shall retain a geotechnical engineer registered in the State of Virginia and testing laboratory to perform soils testing, concrete testing, aggregate base, and asphalt testing.

Submittals - Submit two copies of the following reports directly to the engineer from geotechnical engineer and testing laboratory, with copy to the contractor prior to surfacing: 1) test report on borrow material; 2) verification of subgrade before filling and prior to applying base stone and rock when applicable; and 3) verification of fills, concrete test reports, aggregate base compaction, and asphalt density test. Test results must have approval of the geotechnical engineer and have his seal and signature.

Prior to the spreading of base aggregate, the Contractor shall submit to the engineer, certification from the quarry from which the aggregate is to be purchased that states that the stone meets all V.D.O.T. requirements for the size and type specified.

3.3 Filling - Areas to be rolled shall be cleared and grubbed and topsoil removed. All depressions or holes below the ground surface, whether caused by grubbing or otherwise, shall be backfilled with suitable material and compacted to the ground surface before the construction of the embankment will be permitted to start.

All roots, debris, large stones, or objectional material that would cause interference with compaction or fill shall be removed from the area and disposed of as directed.

All subgrades shall be proofrolled and prepared as directed by the Architect.

Embankments shall be formed of satisfactory materials placed in successive horizontal layers of not more than 8 inches in loose depth for the full width of the cross section. All materials entering the embankment shall be reasonably free of organic matter such as leaves, grass, roots, and other objectionable material. Soil, granular material, shale, and any other material permitted for use in embankments shall be spread in successive layers as specified.

The operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained on account of rain, freezing weather, or unsatisfactory conditions of the field. At all times, the Contractor shall drag, blade, or slope the embankment to provide proper surface drainage.

The material in layers shall be of the proper moisture content before rolling to obtain the prescribed compaction. Wetting or drying of the material and manipulation to secure a uniform moisture content throughout the layer shall be required. Should the material be too wet to permit proper compaction or rolling, all work on all portions of the embankment thus affected shall be delayed until the material has dried to the required moisture content. Sufficient equipment to furnish the required water shall be provided at all times.

Rolling operations shall be continued until the embankment is compacted to not less than 95 percent of the maximum density as determined by the ASTM D-698, at + or - 3% of optimum moisture. Any areas inaccessible to a roller shall be consolidated and compacted by mechanical tampers.

During construction, unless otherwise recommended by the Engineer, the Contractor shall route his equipment at all times both when loaded and when empty over the layers as they are placed and shall distribute the travel evenly over the entire width of the embankment. The equipment shall be operated in such a manner that hardpan, cemented gravel, clay, or other chunky soil material will be broken up into small particles and become incorporated with the other material in the layer.

In the construction of the embankments, starting layers shall be placed in the deepest portion of the fill, and as placement progresses, layers shall be constructed approximately parallel to the finished pavement grade line.

Frozen material shall not be placed in the embankment, nor shall the embankment be placed upon frozen material.

The Contractor shall be responsible for the stability of all embankments and shall replace any portion which, in the opinion of the Engineer, has become displaced due to carelessness or negligence on the part of the Contractor.

3.4 SUBGRADE AND AGGREGATE BASE MATERIAL - All base aggregate material shall be VDOT No. 21B.

Unless otherwise specified, base course material shall be mixed in an approved central mixing plant of the pugmill type. The mixed material shall be placed by means of an approved aggregate

spreader. When specified on the plans or in the contract, the material may be mixed after placing and prior to compaction with a rotor-type mixer to ensure uniformity.

Where the required thickness is more than 6 inches, the material shall be spread and compacted in 2 or more layers of approximately equal thickness, the maximum compacted thickness of any one layer not to exceed 6 inches.

In cut areas, the subgrade shall be scarified 12" and recompacted to 95% Standard Proctor maximum density, as determined by ASTM-698.

3.5 TACK COAT - Shall be in accordance with VDOT Section 310 requirements and shall be Type RC-70.

3.6 BITUMINOUS CONCRETE PAVEMENT - The bituminous concrete pavement shall be constructed in accordance with Section 315 and any other applicable sections as stated in the VDOT Road and Bridge Specifications. This work shall consist of constructing one or more courses of bituminous concrete on the prepared foundation in accordance with these specifications and in reasonably close conformity with the lines, grades, thicknesses, and typical cross-sections shown on the plans or established by the Engineer.

3.6.1 Materials - Bituminous concrete shall conform to Section 211 for the type specified on the plans or in the contract. In the event Marshall design densities begin to exceed 98 percent of the theoretical maximum density during construction, the Contractor shall alter the grading of the aggregate, or otherwise shall obtain the aggregate from a different source.

3.6.2 Placing Limitations - Bituminous mixtures shall not be placed when weather or surface conditions are such that the material cannot be properly handled, finished, or compacted. The surface upon which the bituminous mixtures are to be placed shall be reasonably free of standing water at the time the materials are spread. The VDOT Road and Bridge Specifications shall be consulted as a guide to determine the minimum laydown temperature and application rates of the bituminous concrete.

3.7 FINAL GRADING

3.7.1 The Contractor shall do all grading required to bring the rough graded ground to the finished grades as shown on the drawings, allowing for depth of topsoil, or pavement materials. The Contractor shall grade to provide adequate positive drainage to preclude the ponding of water.

3.7.2 The Contractor shall uniformly distribute topsoil to the required depth over the entire area to be seeded. Where topsoil is spread directly over rock or gravel surfaces, depth of the topsoil shall be a minimum of eight (8) inches thick.

3.7.3 FINISHED EXCAVATION, FILLS AND EMBANKMENTS - Uniformly smooth grade all areas covered by the project, including excavated and filled sections and adjacent transition areas. The finished surface shall be reasonably smooth, compacted and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, except as otherwise specified. The finished surface shall not vary more than 0.10 foot above or below the established grade or approved cross section. All ditches shall be finished so as to drain readily. The surface of areas to be turfed shall be finished to a smoothness suitable for the application of turfing materials. The surface of embankments or excavated areas for road construction, on which a base course or pavement is to be placed, shall not vary more than 0.05 foot from the established grade and approved cross section.

3.8 All clearing, grubbing, excavation, backfilling, filling, stripping of topsoil, erosion controls, planting, and restoration shall be in strict accordance with the specifications.

3.9 CONCRETE CURB AND GUTTER - Curb and gutter shall be installed to the lines, grades, and cross-sections shown on the drawings and in accordance with Section 502 and any other applicable sections of the most current VDOT Road and Bridge Specifications and as detailed in Road and Bridge Standards and any applicable sections therein. The Contractor shall use care in backfilling to avoid disturbing the curb alignment. Curb and gutter shall be placed on compacted base material in accordance with the typical street cross-sections, if shown, or with a minimum of 3" 21-B aggregate base.

3.10 CONCRETE SIDEWALK – Concrete sidewalk shall be installed to the specified width, grades, and cross section as shown on the drawings and in accordance with section 504 and any other applicable sections of the most current VDOT Road and Bridge Specifications.

3.11 CONCRETE ENTRANCES – Concrete entrances shall be installed to the specified width, grade, and locations as shown on the drawings and in accordance with the applicable entrance type as detailed in the most current VDOT Road and Bridge Standards.

END OF SECTION 321000

SECTION 321723 - PAVEMENT MARKINGS

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 all labor, materials, tools and equipment for painted markings applied to asphalt pavement.

1.3 RELATED SECTIONS

A. Section 321000, “Roadway and Parking Lots” – Bituminous Concrete Paving.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.
2. Manufacturer’s Certificate: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of Virginia Department of Transportation (VDOT) for pavement-marking work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Insl-x® manufactured by Sherwin-Williams Company “Setfast Acrylic Waterborne Traffic Marking Paint” or comparable products by one of the following:

1. Aexcel Inc.: “Jet-Dry Waterborne Traffic Paint.”
2. ThorWorks, Inc.: “Sealmaster Pavement Products & Equipment – TTP-1952b Traffic Paint.”
3. Valspar: “Zone Marking Paint.”

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.3 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, adhering to pavement surface forming smooth continuous film one (1) minute after application and tack free by touch so as not to require coning or other traffic control devices to prevent transfer by vehicle tires within ten (10) minutes after application.

1. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions.

B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to pavement. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.4 SCHEDULES

A. Parking lot lines: 4-inch white paint.

END OF SECTION 321723

SECTION 331000 – WATER UTILITIES

PART 1 - GENERAL

1.1 DESCRIPTION - This section of the specifications covers materials of construction, installation procedures, and testing of all proposed potable water lines included in the project.

1.2 RELATED SPECIFICATIONS - The following specification sections include other information relevant to water line construction:

Section 312600 - Excavation and Backfilling for Utilities.

1.3 QUALITY ASSURANCE

A. All construction materials and installation procedures shall comply with all applicable AWWA requirements and the Virginia Department of Health's Waterworks Regulations. All piping utilized shall be stamped with the "NSF-PW" seal, designating that the material is approved for use in potable water systems.

B. Prior to final acceptance, all water lines installed in this project shall be subjected to and pass pressure and bacteriological test procedures detailed herein.

1.4 SUBMITTALS

A. Provide shop drawings for all construction materials.

B. Provide test reports for all tests conducted.

1.5 CONSTRUCTION LAYOUT

A. The Contractor is responsible for construction stakeout required to build the project.

B. During design of the project, the Architect has performed field surveys to determine the location of existing utilities which could conflict with the proposed construction. The plans depict the Architect's best representation of existing conditions. The exact location of all existing utilities may not be known and is not guaranteed to be shown on the plans. It is the Contractor's responsibility to field locate all existing utilities prior to start of construction. The Contractor shall be responsible for repair of any utilities damaged by construction.

C. The plans indicate those portions of the work which are located on private property. Easements for the proposed construction have been obtained by the Owner. It is the Contractor's responsibility to construct the work as shown on the plans and to limit his encroachment on private property to within the easements' boundaries. It is the Contractor's responsibility to replace any property corners damaged by construction using a licensed surveyor.

D. All valve boxes, fire hydrants, blow-off valves, air release valves, meters, sample hydrants, and other appurtenances on VDOT right-of-way shall be located as required by the VDOT inspector.

E. The Contractor is responsible for identifying paved, concrete, unpaved roads and parking lots prior to bidding the project. The cost of surface restoration shall be included in the Contractor's bid. All property disturbed by construction shall be restored to its original condition at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 PIPE - Unless specifically called for on the plans or specified herein, it shall be the Contractor's option to select the type of pipe material for each application from those acceptable materials shown in the Pipe Schedule.

2.1.1 Polyvinyl Chloride Water Pipe - PVC pipe 4" and larger, shall meet the requirements of AWWA C900, be U.L. approved, and shall have dimensions as described in AWWA C900 Table 2, "Outside Diameters of Cast Iron Pipe". Pipe joints shall be rubber gasketed and be of either push on or mechanical type in accordance with ANSI/AWWA Specification C111/A21.11. All PVC pipes shall be stamped with the NSF-PW certification. PVC in sizes less than 4" diameter shall meet the requirements of ASTM D-2241 and be SDR 21.

2.1.2 Polyethylene Service Lines - All 3/4" and 1" service lines shall be polyethylene material, in compliance with AWWA C901-88. Service lines shall be 200 psi pressure class. All polyethylene service lines shall meet NSF Standard No. 61 and shall be stamped with the NSF-PW certification. Pipe stiffeners shall be stainless steel only.

2.2 PIPE FITTINGS

2.2.1 Polyethylene Fittings - All fittings and polyethylene pipe shall be compatible with the pipe specified herein and comply with ANSI/AWWA Specification C110/A21.10. Unless shown or specified otherwise.

2.2.2 Pipe Schedule

PIPE SCHEDULE

SIZE	WORKING PRESSURE (PSI)	ACCEPTABLE MATERIAL
3/4" to 1"	200	Polyethylene CTS SIDR 7
1-1/2" to 3"	200	

2.3 GATE VALVES AND ACCESSORIES

2.3.1 Gate Valves - Gate valves 2" and larger shall conform to AWWA Specifications C-509. Valves shall be ductile iron body, bronze-mounted, Nitrile encapsulated disc, non-rising stem, and capable of withstanding the working pressure to which they are subjected. All valves shown to be located in valve boxes shall have 2" square operating nuts. Valves not buried shall be equipped with handwheels. Valves shall not leak when subjected to the appropriate line test pressure on one side and zero pressure on the other side. Gate valves shall be American Flow Control (Model 2500), Mueller (Model A-2360), Kennedy (Model KS-FW), or Clow (Model 2639) on lines with working pressures 200-250 psi. Valves on lines with working pressures in excess of 250 psi shall be Kennedy Model KS-300.

2.3.2 Valve Boxes - All buried gate valves shall be equipped with a valve box. Valve boxes shall be Tyler 562-S or an approved equal. The valve box shall be of two-piece cast-iron construction

with the cover marked "WATER". Valve boxes shall be threaded to allow the height to be adjusted. All valve boxes shall be installed flush with grade. Valve boxes in areas not paved shall be installed with a concrete collar.

2.4 AIR RELEASE VALVES - All air release valves shall be combination air/vacuum release valves. Combination air/vacuum release valves shall allow air to escape from the distribution system during pipeline filling and normal operation and open to allow air to enter the system during vacuum conditions such as during a line break. The valve shall have an internal float assembly to prevent leakage. Combination air/vacuum release valves shall be Val-Matic Series 200C, Apco, or approved equal.

2.5 SERVICE CONNECTION - Service connections generally include individual water service lines and components required to make a complete functioning assembly as shown on the standard detail plan sheets.

2.5.1 Related Service Connection Items - Service connections shall include all items shown or specified on the standard detail plan sheets: including the following items:

A. 3/4" Corporation Stop - All service connections shall have a corporation stop installed at the point of connection to the distribution system main. Connections to ductile iron mains may either be direct tapped with threaded connections or made with a tapping saddle. A tapping saddle is required when the main waterline is constructed of PVC pipe. Tapping saddles/corporation stops shall be connected to the distribution main at a 45-degree angle to the horizontal plane. Corporation stops shall be brass or bronze, manufactured by Ford - Series FB or Mueller Series 300. Service saddles shall be brass, bronze, or stainless-steel construction, Ford Series S90 or FS200 as applicable or Mueller DR2A Series or A.Y. McDonald.

B. Meter Box - In areas not subject to vehicular traffic, meter boxes may be either reinforced concrete or fabricated from polyethylene. Meter boxes subject to traffic are required to be reinforced concrete. Meter settings which do not require a PRV require a meter box that shall have an 18" minimum diameter with a depth of 30 inches. If the service connection requires a PRV, the meter box shall be 24" minimum diameter with a depth of 30". Meter box lids shall be a Ford Meter box cover Style C32. For a PRV meter box, the appropriate extension ring shall be provided.

C. 3/4" Pressure Reducing Valves - Adjustable 3/4" pressure reducing valves shall be furnished for all service connections so designated on the plans. Residential PRV's shall be Wilkins Model No.600 to match the Owner’s existing equipment inventory with a setting range 25-80 psi or approved equal. All PRV's shall be threaded connection and shall be capable of withstanding inlet pressures up to 250 psi.

2.6 TAPPING VALVE AND TAPPING SLEEVE - Main line connections to lines which cannot be temporarily deadened shall be accomplished with tapping sleeves and valves as indicated on the plans. Tapping valves shall meet requirement of AWWA Standard C500 and shall have flange on one end for bolting to tapping sleeve (per MSS-SP60) for all sizes through 12" and outlet connection compatible with connecting pipe. Tapping sleeve shall be compatible with size and type of pipe to be tapped and flanges to mate all tapping valves through 12". Tapping valves and sleeves shall be as manufactured by American Flow Control, Mueller, or approved equal. Sleeves shall be all stainless steel with carbon steel flange as manufactured by Ford Meter Box Company or equal.

2.7 PRECAST MANHOLES and VAULTS - Unless indicated otherwise, all manholes and valve vaults shall be precast reinforced concrete. Shop drawings showing dimensions, reinforcing, and material specifications shall be submitted to the Architect for approval. All submittals shall be stamped by a Virginia Registered Professional Engineer. Manholes shall be manufactured in accordance with the latest edition of ACI Standard 318. Manhole or vault joints shall be made watertight using flexible butyl mastic sealant. All manholes and vaults shown to have a concrete bottom shall be provided with a floor drain to daylight. All lift rings shall be removed, and all lift holes sealed following installation of the structure.

2.8 MANHOLE FRAMES AND COVERS - Manholes and vaults shall be provided with covers of the type shown on the plans. Iron castings shall conform to the standard specifications for Grey Iron Castings ASTM Specification A-48-41, Class 20. The manhole frame and cover shall be a true 24"minimum opening diameter. One approved model is Dewey No. 3000.

Hinged lids shall be equal to Bilco Type J-AL or Type JD-AL, Halliday, aluminum construction, sized as shown on the drawings. Provide H-20 loading where required. Aluminum hatches shall be coated with a bituminous sealant on all surfaces in direct contact with concrete.

PART 3 - EXECUTION

3.1 PIPE INSTALLATION - All pipe shall be installed using sound construction techniques in compliance with the pipe manufacturer's recommendations, AWWA standards, Virginia Department of Health’s Waterworks Regulations, and the Engineer's requirements. A general overview of installation requirements is included herein:

1. All pipe shall be bedded in accordance with the pipe bedding details shown on the plan sheets and/or as specified in Section 312600, Excavation and Backfilling for Utilities.

   The trench bottom shall be constructed to provide a firm, stable and uniform support for the full length of the pipe. Bell holes shall be provided at the proper location for each pipe joint to permit proper joint assembly and pipe support. When an unstable subgrade condition is encountered which will provide inadequate pipe support, the trench shall be over excavated a minimum of 6" or as required and refilled with suitable foundation material. Unstable subgrade conditions include mud, organic matter, bedrock, or other conditions which would result in unsatisfactory pipe support. In all cases, trench excavation shall be sufficient to provide pipe bedding as shown and/or specified. Trenches shall be excavated as the work progresses and are to be backfilled as the pipe is installed. Trenches shall be fully backfilled at the end of each day and open trenches shall not be left unattended. It is the Contractor's full responsibility to excavate and protect utility trenches in a manner that is safe both to his workers and the general public.

2. Trenches for pipelines shall be excavated using suitable equipment/means for each installation. Pipeline trenches are to be excavated to the required width and grade in a manner to minimize the disturbance to adjacent areas. Excavated trench bottoms are to be firm and stable prior to the installation of the required pipe and bedding. Trenches shall be reasonably dry prior to pipe installation. In locations where water occurs in the trench, the trench shall be dewatered prior to pipe installation. Dewatering may include pumping, diversion, or installation of underdrains.

3. The Contractor shall provide all new materials for construction and shall store and install the materials in a manner which does not result in damage to the material. All materials shall be stored in a manner which will prevent the entry of dirt, mud, animals, or other foreign materials. All PVC pipes shall be stored under a roof or cover to prevent damage

from sunlight. Damaged materials will be rejected, and the Contractor required to provide materials free of defects at no additional charge. Any dirt, mud, or other foreign matter shall be cleaned from all materials prior to installation.

4. All water lines and related appurtenances shall be laid in compliance with the manufacturer's recommendations, Virginia Department of Health's Waterworks Regulations, the plans and specifications and all applicable AWWA requirements. All blisters, excess pipe coatings, or foreign matter shall be removed from the ends of each fitting and piece of pipe. Care shall be taken to properly clean and lubricate the pipe interior and exterior at joints to ensure proper connection. Joint gaskets shall be inspected to ensure proper positioning and alignment. In locations where pipe must be cut to install fittings, valves, or to join other lines, the pipe shall be carefully cut using a pipe saw. Cutting of pipe with a torch shall not be allowed. Following pipe cutting, the cut surface shall be filed or sanded to remove any burrs.

5. Pipelines shall generally be installed in a continuous manner corresponding to plan line numbers as designated on the plans. The Contractor shall not install lines in a manner to purposefully skip sections which would require later completion. Pipe shall be strung daily in amounts equal to the amount anticipated to be installed on that day. Pipe shall not be allowed to be left lying along the proposed line route overnight. Trench excavation and pipe installation shall be in compliance with the VDOT inspector's recommendations or requirements. The Contractor shall fully comply with VDOT's requirements, and any shutdowns or delays caused by the Contractor's noncompliance shall be at the Contractor's expense.

6. All fittings in water mains shall be provided with reaction backing. Reaction backing will be accomplished by installing either concrete thrust blocks or mechanical joint restraints. Concrete thrust blocks shall conform to the dimensions given on the plan sheets. When concrete thrust blocks are used, the water line shall not be pressurized until after the concrete has cured for at least seven days. Fittings anchored by tie rods shall have at least two 3/4" steel rods fastened with clamps around the fitting and around the main. Pipes installed on slopes greater than 20% shall require ductile iron pipe and concrete anchor blocks. Anchor blocks shall be installed no further than 20 feet apart and there shall be at least one anchor block per individual pipe segment.

7. Pipe shall be installed with straight horizontal and vertical alignment at the proper design grade. In locations where bends in the pipe are necessary, the bends shall be accomplished using either fittings or the manufacturer's permissible joint deflection. In no case shall the pipe be bent to achieve alignment changes.

8. The Contractor shall take necessary measures to prevent foreign material from entering the pipe while it is being installed. Pipe trenches shall be dewatered during pipe installation. Special protection shall be provided at open pipe ends to prevent entry of any foreign material. At all times when the pipe is left unattended, the pipe ends shall be plugged to prevent entry of material.

9. As the pipe is installed, the trench shall be backfilled and bedded in accordance with the standard detail plan sheets and the specifications. Pipe bedding and trench backfill material shall be installed in layers and fully compacted. Excess excavated and unsuitable backfill material shall be disposed of by the Contractor at location(s) determined by the Contractor and using disposal methods in full compliance with all applicable laws. The Contractor shall take measures to clean up/repair damage as the work progresses. The Architect reserves the right to shut down the Contractor's pipe laying until sufficient progress is made

toward cleanup/repair. Any loss of time due to shut down because of improper cleanup/repair shall not be considered for time extension.

10. Following main line installation, the water line shall be thoroughly flushed, disinfected, pressure tested, and bacteriologically tested. The water line shall not be placed in service until all required tests have been passed and the Architect authorizes placing the line in service. It is the Contractor's option whether to make taps for proposed service connection before or after pressure testing the main.

11. All water lines (mains and service lines) shall have a detectable underground marking tape installed above the pipe. The marking tape shall be installed at a depth of approximately 4"-12" below the finished ground surface. The marking tape shall be continuously lettered with the caption "CAUTION: BURIED WATER LINE BELOW", detectable by a metal locator, and equal to Lineguard, Inc., detectable marking tape Type III.

12. Prior to project closeout, the Contractor shall clean up all construction debris and restore all surfaces disturbed by construction to as near to their "before construction" condition as possible. All paved areas damaged by construction shall be resurfaced. The Contractor shall restore all areas within VDOT right of way to the satisfaction of the VDOT inspector. All grassed areas shall be revegetated in accordance with Specification Section 329200, Topsoiling and Seeding. Prior to seeding, all disturbed surfaces shall be raked to remove all large rocks, clods, or other debris which could interfere with grass growth. In lawns and other areas subject to mowing, the final surface shall be free of stones and smooth enough to allow mowing. The Contractor shall take all measures necessary to restore grass; including but not limited to reseeding, topsoiling, fertilizing, mulching, or watering - at no additional cost to the Owner. Because final cleanup and restoration is often difficult to achieve to the satisfaction of all parties, the Contractor is highly advised to document the before construction conditions with either photograph or videotape.

3.2 SEPARATION OF WATER LINES AND SANITARY SEWERS - Water lines shall be separated from sanitary sewer lines in accordance with the Virginia Department of Health's Waterworks Regulations. Water lines shall be laid at least ten feet horizontally from sewer lines and sewer manholes whenever possible, the distance shall be measured edge-to-edge.

In locations where water/sewer line crossings are required, the water line shall be laid to provide a separation of at least 18 inches between the bottom of the water line and the top of the sewer whenever possible. In locations where the 10-foot horizontal or 18" vertical separation cannot be achieved, the Architect shall be notified, and work shall cease until the Architect resolves the situation. The water line will either be re-routed to provide the required separation or special measures may be authorized, including the following: When local conditions prevent a horizontal separation of ten feet, the water line may be laid closer to a sewer main or sewer manhole provided that: (1) the bottom of the water line is at least 18 inches above the top of the sewer; (2) where this vertical separation cannot be obtained, the sewer shall be constructed of mechanical joint water pipe, pressure-tested in place for two hours at 50 psi without leakage prior to backfilling; and (3) the sewer manhole shall be of watertight construction and tested in place with zero leakage.

When local conditions prevent the desired 18" minimum vertical separation, the following construction shall be used: (1) sewers passing over or under water lines shall be constructed of mechanical joint water pipe, pressure tested in place for two hours at 50 psi without leakage prior to backfilling; (2) water lines passing under sewers shall, in addition, be protected by providing:

A. a vertical separation of at least 18 inches between the bottom of the sewer line and the top

of the water line,

B. concrete encasement of the water line up to the sewer line to prevent pipe deflection,

C. the water line be centered at the point of the crossing so that water line joints shall be equidistant from the sewer.

D. Sewer Manholes: If a water line passes within 10 feet of a sewer manhole, the sewer manhole shall be tested with zero leakage provided with a waterproof frame and cover.

E. Sewers or Sewer Manholes - No water pipes shall pass through or meet any part of a sewer manhole or any sewer line.

3.4 BORINGS FOR UTILITIES (UNDER ROADS) - Unless specifically noted otherwise on the plans, all utility lines crossing paved public roadways shall be accomplished by jacking or boring and installing the carrier pipe within a steel encasement pipe. All road crossings shall be accomplished in accordance with the VDOT Permit and/or the VDOT inspector's requirements. The Contractor shall first conduct the minimum number of bore attempts (as specified in the VDOT Permit) before special permission to open cut is requested. During boring or open cut installation, the Contractor shall maintain traffic flow on the roadway.

All 4" and larger main line carrier pipes installed inside encasement shall be ductile iron. The Contractor shall exercise extreme care to ensure that the road crossings are installed to the design depth and slope. Carrier pipes shall be supported by wood blocks strapped to the pipe or adjustable mechanical spacers. The pipe supports shall prevent any part of the carrier pipe from coming in contact with the casing. The casing pipe shall be ASTM A53 Grade B & shall conform to Section 232.02(c)5 of the 2007 VDOT Road & Bridge Specifications. The minimum required wall thickness for the steel casing pipe shall be the lesser of ASTM A53 Standard Weight Class for the casing size or 0.5 inches. The casing pipe shall be fabricated to the required length prior to installing the casing in the bore hole. The minimum size diameter casing pipe used for road and railroad crossings shall generally be a minimum of six inches larger than the largest outside diameter of the carrier pipe. A table of the required casing pipe sizes is shown on the standard detail plan sheets.

When road crossings cannot be accomplished by jacking or boring and if special permission is granted by VDOT, road crossings may be made by open cut. At open cut road crossings, the existing pavement shall be saw cut on either edge of the pipeline trench to minimize damage to the adjacent pavement. Following pipe installation, the crossing shall be backfilled full depth with compacted crushed stone. Pavement overlay of the crossing shall be conducted in accordance with the standard detail plan sheets and the VDOT Highway Permit.

3.5 AGGREGATE AND PAVING - Following pipeline installation, disturbed roadways and shoulders shall be repaired. Repair disturbed gravel roadways, driveways, and shoulders. Repair disturbed paved driveways with local material plant mix bituminous concrete. Repair disturbed public roadway pavement in accordance with the standard detail plan sheets and the VDOT Highway Permit.

3.6 INSPECTION AND TESTS - Following installation but prior to placing into service, all water mains shall be subjected to and pass pressure tests, be disinfected, and pass bacteriological testing.

3.6.1 Pressure Testing - After installation, all piping shall be thoroughly flushed by opening hydrants or blowoffs as appropriate. All pressure pipe lines shall then be subjected to a hydrostatic test of

50% greater than the pipe classification pressure of the line being tested for not less than 2 hours during which time the leakage loss shall not exceed the number of gallons per hour for each section tested, as determined by the following formula:

$$L = \frac{SD\,(P)^{1/2}}{148{,}000}$$

L = maximum allowable Leakage, in gallons per hour
S = Length of line under test, in feet
D = Nominal diameter of the pipe, in inches
P = Average test pressure, in psi

Each valved section of water line shall be individually tested between gate valves so that each side of each gate valve is pressurized with the required test psi on one side and zero psi on the other side. Pressure testing shall be conducted as near the high point in the line segment as possible.

The Contractor shall provide all equipment required for the pressure testing and shall be solely responsible for conducting the test. All testing equipment shall be in good working order, to the satisfaction of the Architect. Pressure testing shall only be conducted under the direct supervision of the Architect. If any section under test shows leakage in excess of the allowable amount, the Contractor shall make such repairs to the line as are required to bring the loss within the required limits. Any visible leaks shall be repaired, regardless of the test results. The test pressure shall be maintained within 5 psi of the required test pressure at all times during test.

3.6.2 Disinfection - All water lines shall be disinfected prior to being placed in operation. Prior to disinfection all water lines shall be flushed. All valves and hydrants shall be operated during line flushing. Flushing velocities shall not be less than 2.5 ft/sec.

The contractor shall be responsible for all costs associated with testing. The Owner shall provide the Contractor with enough water to fill, flush, and test the lines one time at no charge. The Owner reserves the right to bill the Contractor for water required for additional flushing. Lines shall be disinfected by chlorination using the following method:

Continuous Feed Method - Potable water shall be introduced into the pipe main at a constant flow rate. Chlorine shall be added at a constant rate to this flow so that the chlorine concentration in the water in the pipe is at least 50 mg/l. The chlorinated water shall remain in the pipeline at least 24 hours, after which, the chlorine concentration in the water shall be at least 10 mg/l. All valve and appurtenances shall be operated while the chlorinated water remains in the pipeline.

After disinfection using the previously discussed method, the heavily chlorinated water shall be flushed from the mains using potable water. The chlorinated water shall not be directly discharged to any creek or stream. After flushing, the mains shall be tested for bacteriological contamination. Two water samples for bacteriological analysis must be collected at least 24 hours apart and analyzed by a Virginia licensed laboratory. The results of these samples must indicate no coliform contamination before the pipe, tanks or equipment can be utilized as part of the waterworks. If contamination is indicated, then the disinfection procedure and subsequent testing must be repeated. Samples shall be collected in accordance with the following general guidelines:

i) samples required at regular intervals on each pipe run and no further than 1,200 feet apart.

ii) samples required at the end of all dead end lines.

iii) at least one set of samples required on each branch line.

END OF SECTION 331000

SECTION 333000 - SANITARY SEWERAGE UTILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

1.2 RELATED SPECIFICATIONS - The following specification sections include other information relevant to sewer line construction:

1.3 SUBMITTALS - Provide shop drawings for all construction materials. Provide test reports for all tests conducted.

1.4 CONSTRUCTION LAYOUT - Construction quantities shown on the plans and designated in the bid schedule are estimated based upon field surveying.

The Contractor is responsible for construction stakeout required to build the project.

During design of the project, the Architect has performed field surveys to determine the location of existing utilities which could conflict with the proposed construction. The plans depict the Architect's best representation of existing conditions. The exact location of all existing utilities may not be known and is not guaranteed to be shown on the plans. It is the Contractor's responsibility to field locate all existing utilities prior to start of construction. The Contractor shall be responsible for repair of any utilities damaged by construction.

The plans indicate those portions of the work which are located on private property. Easements for the proposed construction have been obtained by the Owner. It is the Contractor's responsibility to construct the work as shown on the plans and to limit his encroachment on private property to within the easements' boundaries. It is the Contractor's responsibility to replace any property corners damaged by construction using a licensed surveyor.

The Contractor is responsible for identifying paved, concrete, unpaved roads and parking lots prior to bidding the project. The cost of surface restoration shall be included in the Contractor's unit price bid for pipeline. All property disturbed shall be restored to its original condition to the property owner's satisfaction at no additional cost to the Owner.

1.5 All manholes, cleanouts, vents, and air vacuum relief valves on VDOT right-of-way shall be located as required by the VDOT inspector.

PART 2 - MATERIALS

2.1 PIPE - Unless specifically called for on the plans or specified herein, it shall be the Contractor's option to select the type of pipe material for each application from those acceptable materials specified herein.

2.1.1 Ductile Iron Sewer Pipe - All ductile iron sewer pipe shall be manufactured in accordance with the requirements of ANSI Specification A21.51 (AWWA C151). All ductile iron pipe shall be thickness Class 50 per ANSI Specification A21.50. Pipes shall have an interior cement lining and exterior bituminous seal coating per ANSI Specification A21.51 (AWWA C151).

All fittings shall be ductile iron conforming to the requirements of ANSI A21-10. Fittings shall be provided with an interior cement lining and exterior bituminous seal coating per ANSI A21.51 (AWWA C151).

Pipe joints shall be rubber gasketed push on or mechanical type meeting all applicable requirements of ANSI A2l.11. All pipes shall be stamped by the manufacturer; designating the pipe class, manufacturer, and date of manufacturer.

2.1.2 PVC Sewer Pipe - PVC sewer pipe shall meet AWWA C-900 requirements. The fittings shall be rubber gasketed push on type meeting ANSI A21.10

2.2 PIPE CONNECTIONS - Pipe shall normally be laid using the same type of pipe material continuous from manhole to manhole. In locations where new pipe is to be connected to existing or if different pipe materials are specified to be joined, the pipe connection shall be made using the appropriate Fernco flexible coupling. Couplings shall be installed to maintain a smooth, watertight connection.

2.3. PRECAST MANHOLE - Unless shown or specified otherwise, all manholes shall be precast reinforced concrete type as shown on the standard detail plan sheets. Shop drawings showing manhole dimensions, reinforcing, and material specifications shall be submitted to the Architect for approval. Manholes shall be manufactured in accordance with the ACI 318 and ASTM C-478. Manholes shall be furnished with cast-in-place rubber coated steel steps. Steps shall be skid resistant and spaced approximately 16 inches apart.

All openings for pipe shall be cast-in-place or core drilled. Pipe openings shall be supplied with a flexible connection boot equal to A-LOK or PSX. Flexible boots shall be made from neoprene rubber. All manhole joints shall be waterproofed using flexible bituminous "rope" type sealant applied in the field.

Sewer line connections to existing manholes shall be core drilled and provided with a flexible boot, unless an existing invert is suitable and may be utilized.

Manholes shall be of watertight construction. Unless noted on plans, in areas subject to vehicle travel, manhole tops shall be set by the road grade. A maximum of 12 inches of adjustment rings may be used to reach grade. In areas not subject to vehicles, manhole tops shall be installed above ground, up to a maximum of 24 inches above ground unless otherwise noted on plans. No adjustment rings shall be used to reach this elevation. All lift rings shall be removed, and all lift holes sealed. Inverts shall be shaped providing a smooth flow line without obstructions in accordance with the standard detail plan sheets.

2.4 MANHOLE FRAMES AND COVERS - Iron castings shall conform to the standard specifications for Grey Iron Castings ASTM Specification A-48-41, Class 20. Standard manhole frame and cover shall be MH-1 as specified by the Virginia Department of Highways and Transportation. Waterproof manhole frame and covers shall include a machined dovetail groove on the manhole cover seat, fitted with a continuous dovetail gasket. The weight of the manhole cover compresses the gasket, forming a watertight seal. Standard and waterproof manhole frames and covers shall be manufactured by Dewey Bros., Foundry, U.S. Foundry, or approved equal. All manhole frames and covers shall be attached to the manhole using four (4) 3/4" anchor bolts.

PART 3 - EXECUTION

3.1 PIPE INSTALLATION - All pipe shall be installed using sound construction techniques in compliance with the pipe manufacturer's recommendations, Virginia Department of Environmental Quality’s regulations, and the Architect's requirements. A general overview of installation requirements is included herein:

1. All pipe shall be bedded in accordance with the pipe bedding details shown on the standard detail plan sheets and as specified in Section 312600, Excavation and Backfilling for Utilities.

The trench bottom shall be constructed to provide a firm, stable and uniform support for the full length of the pipe. Bell holes shall be provided at the proper location for each pipe joint to permit proper joint assembly and pipe support. When an unstable subgrade condition is encountered which will provide inadequate pipe support, the trench shall be overexcavated a minimum of 6" or as required and refilled with suitable foundation material. Unstable subgrade conditions include mud, organic matter, bedrock, or other conditions which would result in unsatisfactory pipe support. In all cases, trench excavation shall be sufficient to provide pipe bedding as shown and/or specified. Trenches shall be excavated as the work progresses and are to be backfilled as the pipe is installed. Trenches shall be fully backfilled at the end of each day and open trenches shall not be left unattended. It is the Contractor's full responsibility to excavate and protect utility trenches in a manner that is safe both to his workers and the general public.

2. Trenches for pipelines shall be excavated using suitable equipment/means for each particular installation. Pipeline trenches are to be excavated to the required width and grade in a manner to minimize the disturbance to adjacent areas. Excavated trench bottoms are to be firm and stable prior to the installation of the required pipe and bedding. Trenches shall be reasonably dry prior to pipe installation. Dewatering may include pumping, diversion, or installation of underdrains.

3. The Contractor shall provide all new materials for construction and shall store and install the materials in a manner which does not result in damage to the material. All materials shall be stored in a manner which will prevent the entry of dirt, mud, animals, or other foreign materials. All PVC pipe shall be stored under a roof or cover to prevent damage from sunlight. Damaged materials will be rejected and the Contractor required to provide materials free of defects at no additional charge. Any dirt, mud, or other foreign matter shall be cleaned from all materials prior to installation.

4. All sewer lines and related appurtenances shall be laid in compliance with the manufacturer's recommendations, Virginia Department of Environmental Quality's Sewage Collection and Treatment (SCAT) Regulations, the plans and specifications and all other applicable requirements. All blisters, excess pipe coatings, or foreign matter shall be removed from the ends of each fitting and piece of pipe. Particular care shall be taken to properly clean and lubricate the pipe interior and exterior at joints to ensure proper connection. Joint gaskets shall be inspected to ensure proper positioning and alignment. In locations where pipe must be cut to install fittings, valves, or to join other lines, the pipe shall be carefully cut using a pipe saw. Cutting of pipe with a torch shall not be allowed. Following pipe cutting, the cut surface shall be filed or sanded to remove any burrs.

5. Pipe lines shall generally be installed in a continuous manner corresponding to plan line numbers as designated on the plans. The Contractor shall not install lines in a manner to purposefully skip sections which would require later completion. Pipe shall be strung daily in amounts equal to the amount anticipated to be installed on that day. Pipe shall not be allowed to be left lying along the proposed line route overnight. Trench excavation and pipe installation shall be in compliance with the VDOT inspector's recommendations or requirements. The Contractor shall fully comply with VDOT's requirements and any shutdowns or delays caused by the Contractor's noncompliance shall be at the Contractor's expense.

6. Sewer lines shall be installed by starting at the low point and proceeding uphill. Pipe shall be installed with the bell end uphill. Pipes installed on slopes greater than 20% shall require ductile iron pipe and concrete anchor blocks. Anchor blocks shall be installed no further than 20 feet apart and there shall be at least one anchor block per individual pipe segment.

7. Pipe shall be installed with straight horizontal and vertical alignment at the proper design grade. In locations where bends in the service lines are necessary, the bends shall be accomplished using fittings. In no case shall be pipe be bent to achieve alignment changes. Cleanouts shall be installed on service line as required by the local building inspector.

8. The Contractor shall take necessary measures to prevent foreign material from entering the pipe while it is being installed. Pipe trenches shall be dewatered during pipe installation. Special protection shall be provided at open pipe ends to prevent entry of any foreign material. At all times when the pipe is left unattended, the pipe ends shall be plugged to prevent entry of material.

9. As the pipe is installed, the trench shall be backfilled and bedded in accordance with the standard detail plan sheets and the specifications. Pipe bedding and trench backfill material shall be installed in layers and fully compacted. Excess excavated and unsuitable backfill material shall be disposed of by the Contractor at location(s) determined by the Contractor, and using disposal methods in full compliance with all applicable laws. The Contractor shall take measures to clean up/repair damage as the work progresses. The Architect reserves the right to shut down the Contractor's pipe laying until sufficient progress is made toward cleanup/repair. Any loss of time due to shut down as a result of improper cleanup/repair shall not be considered for time extension.

10. Following installation, all sewer lines shall be tested for leaks. The sewer line shall not be placed in service until all required tests have been passed and the Architect authorizes placing the line in service.

11. All sewer lines (mains and service lines) shall have a detectable underground marking tape installed above the pipe. The marking tape shall be installed at a depth of approximately 4" - 12" below the finished ground surface. The marking tape shall be continuously lettered with the caption "CAUTION: BURIED SEWER LINE BELOW", detectable by a metal locator and equal to Lineguard, Inc., detectable marking tape Type III.

3.2 SEPARATION OF WATER AND SEWER - Water lines shall be separated from sanitary sewer lines in accordance with the Health Department's Waterworks Regulations. Water lines shall be laid at least ten feet horizontally from sewer lines and sewer manholes whenever possible, the distance shall be measured edge-to-edge. When local conditions prevent a horizontal separation of ten feet, the water line may be laid closer to a sewer main or sewer manhole provided that: (1) the bottom of the water line is at least 18 inches above the top of the sewer; (2) where this vertical separation cannot be obtained, the sewer shall be constructed of mechanical joint water pipe, pressure-tested in place to 50 psi without leakage prior to backfilling; and (3) the sewer manhole shall be of water tight construction and tested in place with zero leakage.

In locations where water/sewer line crossings are required, the water line shall be laid to provide a separation of at least 18 inches between the bottom of the water line and the top of the sewer whenever possible. When local conditions prevent a vertical separation described above, the following construction shall be used: (1) sewers passing over or under water lines shall be constructed of mechanical joint water pipe, pressure tested in place to 50 psi without leakage prior to backfilling; (2) water lines passing under sewers shall, in addition, be protected by providing:

a. a vertical separation of at least 18 inches between the bottom of the water and the top of the sewer line,

b. concrete encasement of the water line up to the sewer line to prevent pipe deflection,

c. the sewer line be centered at the point of the crossing so that sewer joints shall be equidistant from the sewer.

d. Sewer Manholes: If a water line passes within 10 feet of a sewer manhole, the sewer manhole shall be tested with zero leakage provided with a waterproof frame and cover.

e. Sewers or Sewer Manholes - No water pipes shall pass through or come in contact with any part of a sewer manhole or any sewer line.

If during construction it becomes evident that the normally required 10 foot horizontal/18-inch vertical water/sewer separation cannot be achieved, the Contractor shall notify the Architect of the situation and receive direction on how to proceed with construction.

In the event there is a well within 50' of any proposed sewer line, the sewer line shall be constructed of mechanical joint water pipe and pressure tested at a pressure 50 psi (25' each side of well) for two hours with zero leakage. Sewer lines shall not be installed within 35' of any well.

3.4 INSPECTION AND TESTS - Following installation but prior to placing into service, all sewer lines and manholes shall be subjected to and pass leakage tests. All tests shall be conducted under the direct supervision of the Engineer. All tests shall be conducted by the Contractor using his equipment and at his expense. All proposed sewer lines shall be tested by either air testing or water testing. All proposed manholes shall be by vacuum testing or exfiltration. If the gravity sewer lines into and out of a manhole have been tested by air testing, then the manhole shall be tested by using the exfiltration procedure.

3.5.1 Sewer Line Air Test - All sewer mains shall be tested from manhole to manhole. The sewer line air test is the preferred test method. Prior to testing, the sewer line shall be flushed to clean. The sewer line air test shall

conform to the latest revision of UNI-B-6. The air testing equipment shall be Air-Lock, as manufactured by Cherne Industrial, Inc., or approved equal. All air used shall pass through a single control panel. Three individual air hoses shall be used for the following connections: from control panel to pneumatic plugs for inflation; from control panel to sealed line for introducing low pressure air; and from sealed line to control panel for continually monitoring the air pressure rise in the sealed line.

Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected. The plugs shall resist internal test pressures without requiring external bracing or blocking; however the Contractor shall provide external bracing during the test as an added safety precaution. Plugs shall be seal tested before being used in the actual test installation. The tested line segment shall be plugged and pressurized to 4.0 psi greater than the groundwater back pressure but not to exceed 9 psi. The line shall be allowed to stabilize for two minutes after pressurization. After the pressure has stabilized, the air pressure shall be decreased slowly to 3.5 psi greater than groundwater back pressure, the air hose from the control panel to the air supply shall be discontinued and the timing shall commence. The amount of time required for the air pressure to drop from 3.5 psi greater than back pressure to 2.5 psi greater than groundwater back pressure (1.0 psi drop) shall be recorded. If the time to drop 1.0 psi is less than that given in the attached Table I, then the line segment has failed. Lines which fail the test shall be repaired and retested until the test has passed. If the amount of time given in Table I expires and the pressure drop is less than 1.0 psi, then that line segment passes.

TABLE I

SPECIFICATION TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP
FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015

Pipe	Minimum Time	Length for Minimum	Time for Longer	Specification Time for Length (L) Shown (min:sec)							
Diameter (in.)	(min: sec)	Time (ft)	Length (sec)	100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34.11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57.41	72.07	86.32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

3.5.2 Sewer Line Water Testing - Water testing of sanitary sewer lines shall be either the infiltration or exfiltration type.

3.5.2.1 Infiltration - Infiltration testing will only be allowed when the groundwater table outside the pipe is no less than 4 feet above the crown of the pipe at all locations. The test will be made by measuring the infiltration flow of water using an appropriate "insert-in-the-pipe" type of 60 degree V-notch weir installed at the downstream manhole. A series of three separate measurements shall be made at 1-hour intervals and the results averaged. The quantity of the infiltration for any section of sewer tested shall not exceed 100 gallons per inch diameter per 24 hours per mile of sewer. Any lines which fail the test shall be repaired and retested until they pass.

Sewer lines which cross a creek, river, or stream shall have zero infiltration. If any infiltration is present, the line shall be either repaired or replaced and retested.

3.5.2.2 Exfiltration - Exfiltration testing shall be used if the pipe trench is dry for its entire length and the groundwater table is below the pipe in all locations. The exfiltration test is conducted by plugging the sewer line at the downstream manhole and filling the sewer line with water until the water depth in the upstream manhole at least 4 feet above the top of the pipe or level with the top of the manhole. The water shall be allowed to stand at least 4 hours then refilled to the starting level. After refilling a timed period of one hour shall be allowed to elapse and the amount of water required to refill shall be measured. The 24-hour loss shall then be computed. The quality of leakage for any section of sewer tested shall not exceed 100 gallons per inch diameter per 24 hours per mile of sewer. Any lines which fail the test shall be repaired and retested until they pass.

Sewer lines which cross a creek, river, or stream shall have zero infiltration. If any infiltration is present, the line shall be either repaired or replaced and retested.

3.6 Manhole Vacuum Testing - Manholes may be tested for leakage using the vacuum test only if the sewer lines into the manhole were not tested by the air test. Manholes are to be tested prior to backfill. Installation and operation of vacuum equipment and indicating devices shall be in accordance with equipment specifications approved by the Health Department.

All pipe openings shall be plugged by pneumatic or mechanical plugs and braced to sustain 10" mercury vacuum. The vacuum test shall be conducted by establishing a 10" mercury vacuum on the manhole and measuring the time required for the vacuum to drop to 9" mercury. The amount of time required for a 1 inch mercury drop shall not be less than those given in the following table:

Minimum Time to Hold 1 in. Mercury Drop

MH Dia.	MH Depth	Min. Time
4'	< 10'	1 min. 0 sec.
4'	10-15'	1 min. 15 sec.
4'	15-25'	1 min. 30 sec.
5'	< 10'	1 min. 15 sec.
5'	10-15'	1 min. 30 sec.
5'	15-25'	1 min. 45 sec.
6'	< 10'	1 min. 30 sec.
6'	10-15'	1 min. 45 sec.
6'	15-25'	2 min. 0 sec.

If the manhole fails the test, necessary repairs shall be made and the vacuum test and repairs shall be repeated until the manhole passes the test. If mastic manhole joint sealant is completely pulled out during the vacuum test, the manhole shall be disassembled and the mastic replaced

3.7 Manhole Exfiltration Testing - Manholes which are not vacuum tested shall be tested by exfiltration. Manholes shall be tested prior to backfilling. This test method shall not be conducted when the groundwater table level is equal to or higher than the manhole invert out elevation.

All pipe openings shall be plugged by pneumatic or mechanical plugs. The manhole shall then be filled with water to the top of the rim. The manhole shall be allowed to soak for a time period not to exceed four (4) hours. Following the initial four (4) hours soaking period, the manhole shall be refilled with water to the top of the rim. The water shall then be allowed to remain in the manhole for a period of four (4) hours. At the end of the four (4) hour test period the amount of leakage will be measured as the volume of water necessary to refill the manhole. The leakage rate shall not exceed 0.25 gallons/hour (1.0 gallons for 4 hour test).

All manholes failing the test shall be repaired or replaced and retested until the manhole passes the test.

3.8 Deflection Test for PVC Pipe - The Architect may require deflection tests on any section(s) of pipe installed. Deflection tests shall be performed at least 30 days after final full backfill has been placed. The deflection test shall be performed by use of rigid balls or mandrels, to be supplied by the Contractor, having diameters equal to 95% of the inside diameter of the pipe, and pulled through the sewer line without the use of mechanical devices. Maximum allowable deflection shall be 5%. Should any pipe fail the test, it shall be dug up, inspected by the Architect, and either replaced or re-installed.

PART 4 – WARRANTY

4.1 WARRANTY - The Contractor shall provide a one-year warranty of the construction, effective as of the date that the relocated sewer line is placed into service. The guarantee does not apply to any item damaged from misuse, lack of maintenance, alteration, neglect, accident, or wear from normal use. All construction under these specifications shall be free from defects in material or workmanship, and the Contractor shall repair or replace at his expense any such defective items during the warranty period. The Contractor shall be responsible for repair or replacement of any equipment or materials which fail to meet the design requirements as specified which are revealed during startup or testing. Repair or replacement of any such items shall be completed within 30 days at the expense of the Contractor.

END OF SECTION

SECTION 334000 - STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.1 This section details all the necessary excavation, backfill, storm sewer pipe, and storm sewer structure installation as identified by line and grade on the construction drawings. All construction and materials shall conform to the most recent editions of the Virginia Department of Transportation, Road and Bridge Specifications and Road Designs and Standards.

PART 2 - PRODUCTS

2.1 STORM SEWER PIPE - The storm sewer pipe shall conform with the VDOT Road Designs and Standards and Sections 232, 302 and any other applicable sections of the V.D.O.T Road and Bridge Specifications.

2.2 STORM SEWER STRUCTURES - The storm sewer structures shall conform with V.D.O.T. Road Designs and Standards and Sections 302, 502 and any other applicable sections as stated in the V.D.O.T. Road and Bridge Specifications.

2.3 PRECAST STRUCTURES - Shop drawings of all precast structures and pipe shall be submitted for approval by the Contractor and shall be stamped and signed by V.D.O.T. and the Contractor indicating their approval of the manufacturer.

2.4 ROOF DRAINS - Footing drainpipe and roof drain pipe shall be Schedule 40 PVC.

PART 3 - EXECUTION

3.1 STORM SEWER PIPE - Construction with storm sewer pipe shall conform to Sections 232, 302 and any other applicable sections as stated in the V.D.O.T. Road and Bridge Specifications for Class III or Class V (as appropriate) reinforced concrete pipe and ASTM F2306 double-wall smooth interior HDPE pipe. Storm pipe may be either reinforced concrete or double-wall smooth interior HDPE unless indicated otherwise. All pipe joints shall be watertight.

3.1.1 Foundation in Poor Soils - Whenever the materials found at the minimum depths of excavation are judged by the Geotechnical Engineer to be unsuitable for founding pipe or structure, the Contractor shall make additional excavation as directed at no additional cost to the Owner, and the additional excavation shall be replaced with No. 25 or No. 26 stone placed to the bottom of structure footing or to support one-half the outside diameter of pipe. In all instances the additional excavation shall be carried 4 inches (minimum) below the bottom of structure footing or pipeline.

3.1.2 Unauthorized Excavation - If any excavation is caused by the Contractor's error, or wherever the excavation is carried beyond or below the lines and grades, the Contractor shall at his own cost and expense refill such excavated space with No. 25 or No. 26 stone placed to support one-half the outside diameter of pipe in order to assure the stability of the pipes and structures, as directed by the Architect.

3.2 STORM SEWER STRUCTURES - Storm sewer structures shall conform to Sections 302, 502 and any other applicable sections as stated in the V.D.O.T. Road and Bridge Specifications. Structures shall be constructed in accordance with the V.D.O.T. Road Designs and Standards. All structures shall have VDOT IS-1 inlet shaping.

3.3 ROOF DRAINS - This section of specifications applies to all underground roof drain piping greater than five (5) feet from the proposed building.

3.3.1 Roof drains unless otherwise noted, shall be:

Piping 6" and smaller: PVC Plastic - not less than Schedule 40 for solvent weld or compression joints. All plastic pipes shall be marked with the appropriate identification of a quality control agency recognized in duly authenticated reports from BOCA.

Piping Larger than 6": All roof drain piping larger than 6" shall be either PVC SDR-35 or ductile iron (Contractor's option)

3.3.2 Cleanouts shall be installed at all changes in direction greater than 45 degrees.

3.3.3 Roof drain piping shall have a minimum grade of 1/8" per foot, except as otherwise indicated on the plans.

3.4 RIP RAP - All rip rapped outfalls indicated on the construction drawings shall conform to Section 414 and any other applicable sections as stated in the Road and Bridges Specifications and shall be placed in accordance with Road Designs and Standards, or any other applicable detail in the construction drawings.

END OF SECTION

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ARCHITECTURE

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