AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

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

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

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

§ 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.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 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 retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and 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 the 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 suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, 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 suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

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 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 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.

§ 2.3.2 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.

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

§ 2.3.4 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.

§ 2.3.5 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.

§ 2.3.6 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.

§ 2.4 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.

§ 2.5 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 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 default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for 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. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

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 its 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 2.3.4, 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 submit 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, subject to Section 15.1.7, 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. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be 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 notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative 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 approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 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

§ 3.5.1 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.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 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 14 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 that an equitable adjustment be made 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, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim 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 notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice 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 and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably 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, or fails to provide submittals in accordance with the approved 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 make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

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 how 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 the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect 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 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.

§ 3.12.10.1 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 be entitled to rely

upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately 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 and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and 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.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 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, 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, or patching shall be restored to the condition existing prior to the cutting, fitting, or 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 construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its 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 and 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 the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with 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 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 an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the 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 Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 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.

§ 4.2 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.

§ 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 promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) 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

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 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 13.4.2 and 13.4.3, whether or not the 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, 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 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 order 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 Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 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 the 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, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice 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 for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, 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 that the Contractor, by these Contract 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; 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 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 term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

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

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its 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 or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has 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 notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work 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. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 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 that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor 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. The Contractor shall proceed promptly with changes in the Work, 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 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine 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 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;

.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, directly related to the change; and

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

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 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.

§ 7.3.7 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.

§ 7.3.8 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 may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

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, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 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 (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended 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

§ 9.1.1 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.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent 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. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and 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 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, suppliers, or other persons or entities that 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 (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole 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 in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. 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. 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 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 suppliers 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 either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

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

§ 9.5.4 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 supplier 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 Contractor shall reflect such payment on its next Application 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 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 and suppliers 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 or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to 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 or provided by 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, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 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' 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 shutdown, 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; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and 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 the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the 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 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 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. 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 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, (3) a written statement that the Contractor knows of no 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, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and 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, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance 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 the lien, claim, security interest, or encumbrance, 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, corrected, 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 the 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;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a 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, a Subcontractor, or a Sub-subcontractor; 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 implement, 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 the owners and users of adjacent sites and utilities of the safeguards.

§ 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. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is 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, notice of the 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 and Substances
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. 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 notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's 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 the material or substance or who are to perform the task of removal or safe containment of the 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 by the amount of the Contractor's reasonable additional costs of shutdown, 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 hazardous 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 hazardous 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 reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances 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 reimburse 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 Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 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.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or

expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 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; (2) the Architect and Architect's consultants; and (3) Separate Contractors, 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 those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 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, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement 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 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

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, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before 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 any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of 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 2.5.

§ 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 of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

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

§ 13.3 Rights and Remedies

§ 13.3.1 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.

§ 13.3.2 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 thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 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 tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 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 13.4.1, 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 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 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.

§ 13.4.4 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.

§ 13.4.5 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.

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

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties 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.

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, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, 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 reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, 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' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work 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' 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 or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.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 reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner 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' 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 under 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 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 Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

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, a change in the Contract Time, 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. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the 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 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by 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 under this Section 15.1.3.1 shall 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.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 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.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 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.

§ 15.1.6.2 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.

§ 15.1.7 Waiver of 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 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, 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. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a 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 the 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.

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

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

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

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

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

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

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

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

§ 15.4 Arbitration

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

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

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

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

§ 15.4.4 Consolidation or Joinder

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

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

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

SECTION 000750 SUPPLEMENTARY GENERAL CONDITIONS

The following supplements modify, change, delete from or add to the "**General Conditions of the Contract for Construction" AIA Document A201, 2017 Edition**. Where any article of the General Conditions is modified or any paragraph, subparagraph or clause thereof is modified or deleted by these Supplementary General Conditions, the unaltered provisions of the Article, Paragraph or Subparagraph shall remain in effect.

The General Conditions of the Contract for Construction may also be supplemented elsewhere in the Contract Documents.

ARTICLE 1 - GENERAL PROVISIONS
Paragraph 1.1 - Basic Definitions
Subparagraph 1.1.1 – The Contract Documents

DELETE the first sentence of Subparagraph 1.1.1 in its entirety and, in lieu thereof, substitute the following:

[*Substitute:*] The Contract Documents are enumerated in the Agreement between Owner and Contractor (hereinafter the Agreement) and consist of the Copyright, the Advertisement for Bids, Instructions to Bidders (AIA Document A701), Supplementary Instructions to Bidders, Bid Forms, Contractor's Qualification Statement (AIA Document A305), Standard Form of Agreement Between Owner and Contractor (AIA Document A101), Employment Verification Act, Affidavit Accepting Provisions of any applicable Workman's Compensation Act, Bid Bond (AIA Document A310), Performance & Payment Bonds (AIA Document A312), Conditions of the Contract (General, Supplementary and Special), Contractor's Affidavit of Release of Liens (AIA Document G706A), List of Drawings, the Drawings, Specifications, all Addenda issued prior to execution of the Contract and all modifications thereto.

DELETE the last sentence of Subparagraph 1.1.1 in its entirety.

Subparagraph 1.1.3 – The Work

ADD the following to the end of the first sentence:

[*Add:*] "including any subcontractor's and sub-subcontractor's work and suppliers or any other entity for which Contractor is responsible and whether on or off the site of the Project."

Subparagraph 1.1.5 – The Drawings

ADD the following to the end of Subparagraph 1.1.5:

[*Add:*] "and shop drawings."

ADD the following new Subparagraphs:

1.1.9 The term "product" includes materials, systems and equipment.

1.1.10 The term “provide” includes furnishing and installing a product, complete in place, operating, tested and approved.

1.1.11 The term “building code” and the term “code” refer to regulations of governmental agencies having jurisdiction.

1.1.12 The terms “approved”, “required” and “as directed” refer to and indicate the work or materials that may be approved, required or directed by Architect acting as the agent of Owner.

1.1.13 The term “similar” means in its general sense and not necessarily identical.

1.1.14 The terms “shown”, “indicated”, “detailed”, “noted”, “scheduled” and terms of similar import refer to requirements contained in the Contract Documents.

Paragraph 1.2 - Correlation and Intent of the Contract Documents

ADD the following new Subparagraphs:

1.2.4 Computed dimensions shall take precedence over scale dimensions, and large scale drawings shall take precedence over small scale drawings.

1.2.5 Anything shown on the Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Drawings shall have the same effect as if shown or mentioned respectively in both. Any work shown on one Drawing shall be construed to be shown in all Drawings, and Contractor shall coordinate the Work and Drawings to conform to the requirements of the Contract Documents.

1.2.6 In the event of conflict between different provisions in the Contract Documents, the provision calling for the higher quality or greater benefit to Owner shall prevail, unless Owner accepts in writing the provision calling for a lower quality or lesser benefit.

1.2.7 If any portion of the Contract Documents shall be in conflict with any other portion, after the application of the rules of interpretation set forth in this Paragraph 1.2, the various documents comprising the Contract Documents shall govern in the order of precedence as herein set forth according to their latest date of execution: (a) Change Orders submitted, processed and approved in accordance with applicable procedure; (b) written amendment to the various agreements (including but not limited to the Agreement) entered into or executed by Owner; (c) the various agreements entered into and executed by Owner, including but not limited to the Agreement (as modified by any Addenda thereto); (d) Addenda; (e) Supplementary and Special Conditions; (f) General Conditions; (g) Division 1 Specifications; (h) Instructions to Bidders; (i) Advertisement for Bids; (j) Bid Form; and (k) Drawings and Specifications. In the event of an inconsistency between the Specifications and Drawings, the interpretation as determined by Architect shall prevail; as between large scale drawings and small scale drawings, the large scale drawings shall take precedence. Specifications having greater detail or specificity take priority over specifications of lesser detail or specificity and detail takes precedence over general drawings.

1.2.8 Any component, material or equipment necessary to complete a system but not specifically described or depicted in the Contract Documents shall be included in the Work as if it were described or shown in the Contract Documents without an adjustment in the Contract Sum or Contract Time.

Paragraph 1.5 - Ownership and Use of Drawings, Specifications and Other Instruments of Service

ADD the following new Subparagraphs:

1.5.3 All reports, plans, specifications and computer files relating to this project (hereinafter the Instruments of Service) are the property of Crabtree, Rohrbaugh & Associates. Crabtree, Rohrbaugh & Associates retains all common law, statute and other reserved rights including the copyright thereto.

1.5.4 Except as provided in Section 000101, Sub-subparagraph 3.1.4.1, or as otherwise agreed upon with Owner, reproduction of the material herein or substantial use without written permission of Crabtree, Rohrbaugh & Associates violates the copyright laws of the United States and will be subject to legal prosecution.

Paragraph 1.6 – Notice
Subparagraph 1.6.1

DELETE the following from the end of the subparagraph and, in lieu thereof, SUBSTITUTE it as follows:

[*Delete:*] "if a method for electronic transmission is set forth in the Agreement."

[*Substitute:*] ", and actually received by the individual for which it was intended. Notice by mail shall be effective three (3) days after deposit in the mail. In addition, notice to the Contractor may be in the form of meeting minutes."

ADD new Subparagraph 1.6.3 as follows:

1.6.3 With regard to giving notice, the designated representative shall be as set forth in Paragraphs 8.3 and 8.4 of AIA Document A101 Standard Form of Agreement Between Owner and Contractor.

Paragraph 1.7 – Digital Data Use and Transmission

DELETE the last sentence of Paragraph 1.7 in its entirety, and in lieu thereof, replace it with the following:

[*Replace*] "Protocols governing the use of Architect's Instruments of Service are defined in Sub-subparagraphs 3.12.4.1 through 3.12.4.9 of these Supplementary General Conditions. The stated protocols apply only to the use of .dwf or .dwg format files. A separate Media Agreement, as provided by Architect, must executed by Contractor when requesting the Revit Model.

Paragraph 1.8 – Building Information Models Use and Reliance

DELTETE Paragraph 1.8 in its entirety and, in lieu thereof, SUBSTITUTE the following new Paragraph.

1.8 A separate Media Agreement stating protocols governing the use of Architect's building information model (Revit Model) must be executed by Contractor when requesting the Revit Model.

ARTICLE 2 - OWNER
Paragraph 2.1 - General
Subparagraph 2.1.1

CHANGE the first part of the first sentence to identify Owner as follows:

County of Fluvanna
132 Main Street
Palmyra VA 22963

In the second sentence, REVISE "with respect to all matters requiring Owner's approval or authorization" to "to the extent authorization by Owner's Board of School Directors."
Subparagraph 2.1.2

DELETE Subparagraph 2.1.2 in its entirety.

Paragraph 2.2 – Evidence of the Owner's Financial Arrangements

DELETE Paragraph 2.2, including all subparagraphs, in its entirety.

Paragraph 2.3 Information and Services Required of the Owner
Subparagraph 2.3.3

CHANGE "shall employ" to "may employ" in the first line.

DELETE "as to whom the Contractor has no reasonable objection" from the second line.

Subparagraph 2.3.4

DELETE the last sentence in its entirety, and in lieu thereof, SUBSTITUTE the following new sentence:

[*Substitute*] "Contractor shall be responsible to verify the accuracy of the site's physical characteristics, legal limitations and utility locations and bring to the attention of Owner and Architect any discrepancies discovered that may affect the Work."

Subparagraph 2.3.5

INSERT at the beginning of the first sentence: "Upon written request from the Contractor,"

Subparagraph 2.3.6

DELETE Subparagraph 2.3.6 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

2.3.6 Contractor with whom Owner shall enter into a contract shall be entitled to receive up to three (3) sets of drawings and specifications without charge.

Paragraph 2.4 - Owner's Right to Stop the Work

DELETE the word "repeatedly" from the first sentence.

ADD the following to the end of the Subparagraph:

[*Add:*] "This right shall be in addition to and not in restriction of or derogation of Owner's rights under Article 14 hereof. Owner's right to stop the Work shall not relieve Contractor of its responsibilities and obligations under or pursuant to the Contract Documents. In the event an order by Owner to stop the Work is determined to be inappropriate, it shall not constitute a breach of Contract by Owner, but rather shall be a suspension of Work for the convenience of Owner.

Paragraph 2.5 - Owner's Right to Carry Out the Work

REVISE the second line of the first sentence from "a ten-day period" to a "a seven-day period".

DELETE the second sentence in its entirety and, in lieu thereof, SUBSTITUTE the following new sentence:

In such case, Owner shall have the right to deduct from payments then or thereafter due Contractor, the cost to Owner of correcting such default or neglect, including Owner's expenses and any fees or costs charged by attorneys, Architect or Owner's Representative in connection with such corrective action.

ADD the following to the end of the Subparagraph:

[*Add:*] "Nothing contained herein shall obligate Owner to carry out work for the benefit of Contractor."

[*Add:*] "This right shall be in addition to and not in restriction of or derogation of Owner's rights under Article 14 hereof. Owners right to stop the Work shall not relieve Contractor of its responsibilities and obligations under or pursuant to the Contract Documents.
[Add:] "Owner shall not be required to comply with the seven-day notice provision stated above, and shall have the right to immediately correct any deficiencies of Contractor subject to the remaining provisions of this Paragraph 2.5, where providing such notice would impose risk of substantial disruption to the Project schedule or to the safety of any person or property."

ADD new Paragraph 2.5 as follows:

Paragraph 2.6 – Owners Representative
Subparagraph 2.6.1

2.6.1 Owner's Representative during construction is Owner's designated and authorized representative to stop work for, including, but not limited to, unsatisfactory field test results, deficient materials, equipment or systems, deficient work or unsatisfactory installations. The following is a description of the services being provided by Owner's Representative to Owner and how Owner's Representative is to interact with Architect and Contractor. Owner's Representative shall assist Owner in observing performance of the work of Contractor. Owner's Representative shall endeavor to provide further protection for Owner against defects and deficiencies in the work of Contractor; but, furnishing of such services will not make them responsible for or give them control over construction means, methods, techniques, sequences or procedures for safety precautions or programs, or responsibility for Contractor's failure to perform the Work in accordance with the Contract Documents and in particular the specific limitations set forth in this Agreement are applicable. The duties and responsibilities of Owner's Representative are limited and described as follows:

2.6.1.1 Owner's Representative is Owner's agent at the site and will act as directed by and under the supervision of Owner and will confer with Architect, Owner and Contractor, keeping Owner advised as necessary. Owner's Representative's dealings with subcontractors shall only be through or with the full knowledge and approval of Contractor. Owner's Representative shall generally communicate with Owner with the knowledge and under the direction of Owner.

2.6.1.2 Schedules: Review the progress schedule, schedule of shop drawing submittals and schedules of value prepared by Contractor and consult with Architect and Owner concerning acceptability. Monitor Contractor's prepared Project Schedule and Contractor's progress and conformance with project completion dates, pursuant to the schedule criteria.

2.6.1.3 Conferences and Meetings: Attend meetings with Architect and Contractors, such as Pre-Construction Conferences, Progress Meetings, Job Conferences, and other project-related meetings.

2.6.1.4 Liaison: Service as Owner's liaison with Contractor, and assist in understanding the intent of the Contract Documents; assist Architect and Owner in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-site operations.

2.6.1.5 Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

2.6.2 Shop Drawings and Samples:

2.6.2.1 Record date of receipt of Shop Drawings and Samples.

2.6.2.2 Receive samples which are furnished at the site by Contractor, and notify Architect and Owner of availability of samples for examination.

2.6.2.3 Advise Architect, Owner and Contractor of the commencement of any Work requiring a shop drawing or sample or if the submittal has not been approved by Architect and Owner.

2.6.3 Review of Work, Rejection of Defective Work, Inspections and Tests:

2.6.3.1 Conduct on-site observation of Work in progress to assist Architect and Owner in determining if the Work is in general, proceeding in accordance with the Contract Documents.

2.6.3.2 Report to Architect and Owner whenever they believe that any Work is unsatisfactory, faulty, or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Architect and Owner of Work that they believe should be corrected or rejected or should be uncovered for observation or requires special testing, inspection or approval. Owner's Representative shall be officially designated to act on Owner's behalf as its authorized representative to exercise Owner's right to stop and/or suspend work or reject materials, equipment and systems or other non-conforming, deficient, incomplete and unacceptable work in complete accordance with AIA General Conditions, Article 2.3, provided in the Contract Documents by Architect.

2.6.3.3 Verify that all tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that Contractor maintains adequate records thereof; and observe, record, and report to Architect and Owner.

2.6.4 Interpretation of the Contract Documents: Report to Architect and Owner when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor, clarifications and interpretations as issued by Architect and Owner.

2.6.5 Modifications: Consider and evaluate Contractor's suggestions for modifications on Drawings or Specifications and report recommendations to Architect and Owner. Transmit to Contractor decisions issued by Architect and Owner.

2.6.6 Records:

2.6.6.1 Maintain at the job site orderly files for correspondence, reports of Job Conferences, Shop Drawings and Samples, reproductions of original Contract Documents including all Work Directive Changes, Addenda, Change Orders, Field Orders, additional drawings issued subsequent to the execution of the Contract, Architect and Owner clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.

2.6.6.2 Keep a diary or log book, recording Contractor hours on the job site, weather conditions, data relative to questions of Work Directive Changes, Change Orders or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures and send copies to Architect and Owner.

2.6.6.3 Record names, addresses and telephone numbers of all Contractors, subcontractors and major suppliers of materials and equipment.

2.6.7 Reports:

2.6.7.1 Furnish Architect and Owner periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of shop drawing and sample submittals.

2.6.7.2 Consult with Architect and Owner in advance of scheduled major tests, inspections or start of important phases of the Work.

2.6.7.3 Draft proposed Change Orders and Work Directive Changes, obtaining backup material from Contractor and recommend to Architect and Owner, Change Orders, Work Directive Changes, and Field Orders.

2.6.7.4 Report immediately to Architect and Owner upon the occurrence of any accident.

2.6.8 Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedures for their submission and forward with recommendations to Architect and Owner, noting particularly the relationship of the payments requested to the Schedule of Values, Work completed and materials and equipment delivered at the site but not incorporated into the Work.

2.6.9 Certificates, Maintenance, and Operations Manuals: During the course of the Work, verify that certificates, maintenance and operations manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to Owner prior to final payment for the Work.

2.6.10 Completion:

2.6.10.1 Before Architect and Owner issue a Certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.

2.6.10.2 Conduct a final inspection in the company of Architect, Owner, and Contractor and prepare a final list of items to be completed or corrected.

2.6.10.3 Observe that all items on the final list have been competed or corrected and make recommendations to Architect and Owner concerning acceptance.

2.6.11 Owner's Representative - Limitations of Authority:

2.6.11.1 Shall not authorize any deviation from the Contract Documents or substitution of materials or equipment, unless authorized by Architect and Owner.

2.6.11.2 Shall not exceed limitations of Architect and Owner's authority as set forth in the Agreement or the Contract Documents.

2.6.11.3 Shall not undertake or limit any of the responsibilities of Contractor, Subcontractors or Contractor's superintendent.

2.6.11.4 Shall not advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences, or procedures of construction unless such advice or directions are specifically required by the Contract Documents.

2.6.11.5 Shall not advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.

2.6.11.6 Shall not accept Shop Drawings or Sample Submittals from anyone other than Contractor.

2.6.11.7 Shall not authorize Owner to occupy the Project in whole or in part.

2.6.11.8 Shall not participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by Architect and Owner.

ARTICLE 3 - CONTRACTOR

Paragraph 3.2 - Review of Contract Documents and Field Conditions by Contractor

Subparagraph 3.2.2

DELETE the second sentence in its entirety and, in lieu thereof, SUBSTITUTE the following new sentences:

[*Substitute:*] "Contractor shall not be liable to Owner or Architect for any costs, fees or damage resulting from errors, inconsistencies or omissions in the Contract Documents unless Contractor should have reasonably recognized such error, inconsistency or omission and failed to report it to Architect. Contractor warrants that Contractor has carefully studied and reviewed the Contract Documents and that Contractor has reported any errors, inconsistencies or omissions to Architect. Contractor hereby acknowledges and declares that the Contract Documents are full and complete, are sufficient to have enabled Contractor to determine the cost of the Work and to fulfill all of Contractor's obligations under the Contract Documents. If Contractor encounters an error, inconsistency or omission, Contractor shall immediately submit it to Architect for resolution. If Contractor performs any construction activity knowing or having reason to know that it involves an error, inconsistency or omission, Contractor shall be responsible for such performance and shall bear the costs for correction. Contractor shall be liable to Owner for all costs fees by attorneys or Owner's Representative, and fees or costs for Additional Services of Architect (as defined in the Prime Agreement between Owner and Architect) to the extent that such fees and costs are caused by or arise from any deficient Work or the negligent acts or omissions of Contractor. Notwithstanding any other dispute resolution procedure or right provided in this Agreement, Architect shall render a determination regarding whether such Additional Services were caused by or arose from the negligent acts or omissions of Contractor and such determination shall be final and binding on Contractor."

3.2.2 Contractor shall carry out their duty with and shall exercise reasonable diligence in the performance of the Work contained in the Contract Documents as it pertains to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, and Contractor shall promptly report to the Construction Manager and Architect any nonconformity discovered by or made known to Contractor as a request for information submitted to Construction Manager and Architect in such form as the Construction Manager and Architect may require.

Subparagraph 3.2.4

DELETE Subparagraph 3.2.4 in its entirety.

Paragraph 3.3 - Supervision and Construction Procedures

Subparagraph 3.3.2

ADD the following to the end of the last Subparagraph:

[*Add:*] "…or claiming by, through or under Contractor and for any damages, losses, costs and expenses resulting from such acts or omissions. If any failure by Contractor to comply with the Contract Documents or to maintain an approved project schedule causes any damage or costs to Owner, then Contractor shall indemnify and hold harmless Owner for any such damage or costs. Such damage or cost to Owner shall include any payment by Owner to others or liability of Owner to others resulting from such failure by Contractor, including but not limited to (1) any payment for liability arising from change orders, claims, arbitration, or litigation, or (2) any payment or liability for fees or costs to Owner's Representative, Architect, consultants, experts and attorneys.

ADD the following new Subparagraph:

3.3.4 In the event any of the Work is required to be inspected or approved by any governmental authority having jurisdiction, Contractor shall cause such inspection or approval to be scheduled and performed. No inspection performed or failed to be performed shall release Contractor from its obligations to have such work inspected nor shall it be construed as an approval or acceptance of the Work or any part thereof.

Paragraph 3.4 - Labor and Materials
Subparagraph 3.4.1

ADD the following new Sub-subparagraph to Subparagraph 3.4.1:

3.4.1.1 Refer to Division 1, Section "Temporary Facilities and Controls", for detailed requirements regarding temporary utilities, services and facilities.

Subparagraph 3.4.2

DELETE Subparagraph 3.4.2 in its entirety, and in lieu thereof, SUBSTITUTE the following new Subparagraph:

3.4.2 Refer to Division 1, Section "Substitutions", for additional requirements regarding substitutions.

Subparagraph 3.4.3

ADD the following new sentence to the end of the Subparagraph:

[*Add:*] "Owner encourages but does not require that laborers and mechanics employed on the Project be residents of the County in which the work is being performed. Contractor shall be licensed in accordance with all applicable requirements of Fluvanna County. Upon request of Owner, Contractor shall remove from the project any worker who is incompetent, careless or unsafe."

Paragraph 3.5 – Warranty
Subparagraph 3.5.1

DELETE "inherent in the quality of the work" from the second sentence.

DELETE the word "may" from the third sentence and replace it with "will".

ADD to the following to the end of the third sentence.

[*Add*] "unless Owner accepts in writing such nonconforming Work."

ADD the following new sentence to the end of the Subparagraph:

[*Add:*] "Contractor will protect both new work and existing conditions during the period of construction which may be susceptible to damage or abuse.

ADD the following new Subparagraphs:

3.5.3 Contractor's warranty period shall be 1 year from the date of Substantial Completion of the Work and/or phase of the Work, except for specific items of work or equipment for which the warranty period is specified as a longer period elsewhere in the Contract Documents. During the warranty period, Contractor shall promptly correct all defects which are due to defective materials or workmanship at no cost to Owner. Such correction shall extend to any other work damaged by such correction.

3.5.4 At the end of the 11 month period from from the commencement of the warranty period, Contractor shall schedule a walk-through inspection with Owner and Architect to identify any warranty items to be corrected under such warranty period.

3.5.5 Contractor shall be responsible for scheduling the eleven (11) month walk-through inspection contemplated in this warranty Section. The one (1) year Contractor's warranty period shall be extended for a period of thirty (30) days beyond the date the eleven (11) month walk-through inspection is actually performed. It is the intent of this Section to extend the warranty period by thirty (30) days beyond the date the eleven (11) month walk-through inspection is finally completed in order to give Owner the benefit of the walk-through inspection prior to the expiration of the warranty period. The thirty (30) day extension period shall not begin to run until final completion of the walk-through inspection. Thus, if the walk-through inspection takes more than one day to complete, the thirty (30) day extension begins to run from the date the walkthrough is actually completed. If Owner unreasonably refuses to schedule the eleven (11) month walk-through inspection, Contractor shall notify Owner in writing of a date on which Contractor shall be available to perform the walk-through inspection, which date shall not be less than ten (10) days after the date of Contractor's letter, and the thirty (30) day extension shall begin to run from the date of the proposed walk-through inspection. Under no circumstances shall Contractor's warranty expire in less than one (1) full year.

3.5.6 Even after the eleven (11) month walk-through inspection, Contractor shall remain responsible to correct, at no cost to Owner, any defective Work or material discovered thereafter that is not in compliance with the Contract Documents and for any damages arising from such defective Work or material.

Paragraph 3.6 - Taxes

ADD the following new Subparagraph 3.6.1

3.6.1 Refer to Division 0, Section “Supplementary Instructions to Bidders”, Article 10, regarding tax advantages for political subdivisions.

Paragraph 3.7 - Permits, Fees, Notices and Compliance with Laws
Subparagraph 3.7.1

DELETE Subparagraph 3.7.1 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

3.7.1 Owner, through Architect, will submit drawings and specifications to the appropriate public authorities having jurisdiction, for approval. Owner will pay all fees for plan checking.

Subparagraph 3.7.3

DELETE “knowing it to be” from the first line of subparagraph 3.7.3

ADD the following new sentence to the end of Subparagraph 3.7.3:

[*Add:*] “Owner shall not be responsible for any inspection fees due to re-inspection of rejected work due to faulty or defective workmanship of Contractor, or scheduling error by Contractor. Contractor shall be responsible for all such re-inspection fees.”

Subparagraph 3.7.4

CHANGE “14 days” to “10 days” in line five, and after “both” in line nine, ADD “if appropriate under Articles 7 and 8 hereof”.

Paragraph 3.8 - Allowances

DELETE Paragraph 3.8 in its entirety. No cash allowances are permitted.

Paragraph 3.9 – Superintendent
Subparagraph 3.9.2

DELETE subparagraph 3.9.2 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

3.9.2 Contractor shall provide Architect and Owner a resume of its superintendent within 10 days after signing the Contract. If at any time during the course of the Project, Owner objects to any superintendent or assistant, Contractor shall submit a substitute to whom Owner has no objection. No increase in the Contract Sum or Contract Time shall be allowed for any such substitution.

DELETE subparagraph 3.9.3 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

3.9.3 If during the course of the Project, Contractor proposes to replace its superintendent, written notice shall be given to Owner and Architect. Written notice shall include a

resume of the new superintendent. Upon objection by Owner, Contractor shall not assign the proposed new superintendent, and no increase in the Contract Sum or Contract Time shall be allowed.

Paragraph 3.10 - Contractor's Construction and Submittal Schedules

ADD new Sub-subparagraph 3.10.1.1 as follows:

3.10.1.1 Refer to Division 1, Section "Construction Progress Documentation", for further requirements regarding construction schedules.

Paragraph 3.11 - Documents and Samples at the Site

DELETE the last sentence of Paragraph 3.11 and, in lieu thereof, SUBSTITUTE the following new sentence:

[*Substitute:*] "These shall be in electronic form or paper copy, available to Architect and Owner, and shall be delivered to Owner, in good condition, upon completion of the Work, and before final payment is made."

Paragraph 3.12 - Shop Drawings, Product Data and Samples

ADD the following new Sub-sub paragraphs:

3.12.4.1 Issuance of the Design Professional's Instruments of Service via electronic media in either .dwf or .dwg file format, hereinafter referred to as "Media" will be provided at the request of Contractor. This Media is provided without detail and dimensions and is for illustrative purposes only and does not amend, supplement or replace any drawing, Contract Document, Specification and/or in any way, the Contract requirements of such. The purpose of this Media is solely for coordination by Contractor and shall not be relied upon for any other purpose. Contractor fully releases the Design Professional, its agents, officers, and employees, and consultants, from any and all liability, including without limitation, damages, consequential damages, costs and attorney's fees that Contractor may incur as a result of its reliance on the information contained in the Media.

3.12.4.2 In accepting and utilizing Media provided by the Design Professional, Contractor covenants and agrees that all such Media are instruments of service between the Design Professional and the client of the Design Professional, who shall be deemed the author of the Media, and the Design Professional shall retain all common law, statutory law and other rights, including copyrights, whether or not such copyright is registered. Contractor acknowledges that the information and designs contained on the Media are provided to Contractor as a convenience and at the request of Contractor. Contractor also acknowledges that there may be undiscovered errors or inconsistencies in the Media that may result from any number of issues, including migrating the data from printed material to the Media or from others adding information to, or changing information in, the Media once transmitted to Contractor. Contractor agrees not to hold the Design Professional responsible for any

defects Contractor may discover with the Media or information contained in the Media.

3.12.4.3 Contractor agrees not to use the Media, in whole or in part, for any purpose or project other than the Project of this Contract. Contractor agrees to waive all claims against the Design Professional resulting in any way from use of the Media.

3.12.4.4 Contractor agrees, to the fullest extent permitted by law, to defend, release, indemnify and hold the Design Professional harmless from and against any and all claims, damage, loss, liability or cost, including reasonable attorney's fees and costs of defense, arising out of or resulting from any changes made by anyone other than the Design Professional, or from any reuse of the Media, and data contained on the Media without the prior written consent of the Design Professional.

3.12.4.5 Contractor recognizes that information contained on the Media may not be 100% compatible with Contractor's computer system; therefore, Contractor agrees that the Design Professional shall not be liable for the completeness or accuracy of any materials provided on the Media arising out of, due to, or resulting from the difference in computer and software systems, or translations or mistranslation of electronic data, the incompatibility of viewing or operating programs, or the corruption of documents or data as a result of compatibility issues.

3.12.4.6 Contractor recognizes that information stored on electronic media including, but not limited to, computer disks may be subject to undetectable alteration and/or uncontrollable deterioration, due to, among other causes, errors in transmission, conversion, media degradation, software error or human error or alteration. Accordingly, the Media is provided for informational purposes only and is not intended as an end-product. Contractor therefore agrees that the Design Professional shall not be liable for the completeness or accuracy of any materials provided on the Media for this or any other reason whatsoever.

3.12.4.7 Under no circumstances shall the transfer of instruments of service in electronic media, for use by Contractor, be deemed a sale by the Design Professional, and the Design Professional makes no warranties, either expressed or implied, of merchantability and fitness for any particular purpose of the electronic media, or the information stored or contained thereon. Contractor acknowledges that the Media is provided as a convenience by the Design Professional at Contractor's request, and Contractor assumes all risk in the use of the Media, and the data contained therein for any purpose. Contractor further acknowledges that the Design Professional was not engaged to provide usable electronic data, or a usable system, compilation, Model or program to Contractor or any other party. Contractor agrees that the Design Professional shall not be liable in any manner whatsoever for any subsequent usage of the data provided on electronic media.

3.12.4.8 Contractor agrees that in the event of a conflict between non-electronic data and data provided on the Media, including but not limited to the Model, the data contained on non-electronic documents presides over data on the Media. While the Design Professional has made a reasonable effort in accordance with the generally accepted standards of professional skill and care so that the data contained on the Media is accurate, the Design Professional makes no representation or warranty concerning the accuracy of the data contained on the Media, or any viruses contained in the materials as delivered or any other defect or error or alleged defect or error in the materials as delivered.

3.12.4.9 Contractor, by submitting a Bid and requesting electronic media from the Design Professional, accepts all terms of use of the Media as stated herein. Media will be provided to Contractor, upon Contractor's request, and upon remittance of payment to the following schedule:

- 1 to 10 Sheets as they appear in the Contract Documents - $100
- 11 to 20 Sheets as they appear in the Contract Documents - $200
- 21 to 30 Sheets as they appear in the Contract Documents - $300
- 31 to 40 Sheets as they appear in the Contract Documents - $400

The above costs apply to Architectural sheets only. The cost for electronic files for the engineering disciplines may vary. The Engineer of Record, as the author of the engineering drawings, shall be contacted directly for cost information, and the procedures for requesting their electronic media.

ADD new Subparagraph 3.12.11 as follows:

3.12.11 Refer to Division 1, Section "Submittals", for further requirements regarding shop drawings, product data and samples.

Paragraph 3.13 Use of Site
Subparagraph 3.13.1

ADD new Subparagraph 3.13.1 as follows:

3.13.1 Control or Reference Points: Immediately upon occupancy of the project site for the purpose of commencement of the Work, Contractor shall locate, including but not limited to, all general control or reference points, benchmarks, etc., and take such action as may be necessary to prevent damage or destruction of such points. In the event Contractor fails to do so, Contractor shall be liable for all such costs necessary to re-establish such control or reference points.

Paragraph 3.14 - Cutting and Patching

DELETE Paragraph 3.14, including all subparagraphs, in its entirety, and in lieu thereof, SUBSTITUTE it with the following new Paragraph:

3.14 Refer to Division 1, Section "Cutting and Patching", for requirements regarding cutting and patching.

Paragraph 3.15 Cleaning Up
Subparagraph 3.15.1

ADD new Subparagraph 3.15.3 as follows:

3.15.3 Refer to Division 1, Section "Contract Closeout", for further requirements regarding cleaning up.

Paragraph 3.18 Indemnification
Subparagraph 3.18.1

ADD "of any kind" after the word "expenses" in the first sentence.

DELETE "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)" from the first sentence.

ADD "wrongful or" before the word "negligent" from the first sentence.

ADD the following new Paragraphs as follows:

3.19 Contractor shall indemnify Owner for any additional fee, cost or expense (beyond a base fee) charged to Owner by Architect or other project consultant pursuant to its own agreement with Owner to the extent such additional fee, cost or expense is caused by Contractor's acts or omissions.

3.20 Owner may deduct amounts owed by Contractor pursuant to Paragraph 3.18 or 3.19 from payments otherwise due to Contractor, and upon request of Owner shall provide Contractor a copy of the written agreement requiring such additional payment.

ARTICLE 4 - ARCHITECT
Paragraph 4.1 - General
Subparagraph 4.1.2

DELETE the word "Contractor" from the second line.

Paragraph 4.2 – Administration of the Contract

Subparagraph 4.2.4

DELETE the first and second sentences in their entirety and, in lieu thereof, SUBSTITUTE the following:

[*Substitute:*] "Owner and Contractor shall endeavor to communicate with each other through Architect about matters arising out of or relating to the Contract."

Subparagraph 4.2.5

ADD to the end of the subparagraph, the following:

[*Add:*] ", with Certificates for Payment being subject to Owner approval."

Subparagraph 4.2.6

ADD the following to the end of the first sentence.

[Add:] “and shall do so unless Owner accepts such nonconforming work”

Subparagraph 4.2.9

ADD after “Certificates of Substantial Completion” AND after “a final Certificate for Payment”, both in the first sentence, the following:

[*Add:*] “subject to Owner approval,”

ARTICLE 5 – SUBCONTRACTORS

Paragraph 5.2 - Award of Subcontracts and Other Contracts for Portions of the Work

Subparagraph 5.2.1

DELETE the first sentence of Subparagraph 5.2.1 and, in lieu thereof, SUBSTITUTE the following new sentence:

[*Substitute:*] “Within fourteen (14) days after the award of the Contract, Contractor shall notify Owner and Architect, in writing, the names of the persons or entities, including those who are to furnish materials or equipment fabricated to a special design, proposed for each of the principal portions of the Work.

Subparagraph 5.2.3

DELETE the second and third sentences in their entirety and, in lieu thereof, SUBSTITUTE the following:

[Substitute:] “In the event of any such objection, Contractor shall not contract with the proposed person or entity, and there shall be no increase in the Contract Sum or Contract Time.”

Paragraph 5.3 – Subcontractual Relations

ADD the following to the end of Paragraph 5.3

[*Add:*] Under no circumstances shall it be deemed that privity of contract relationship is established or exists at any point between Owner and any subcontractors of Contractor.

ADD new Paragraph 5.5 as follows:

Paragraph 5.5 - Payment to Subcontractors

5.5.1 Contractor shall pay each subcontractor, upon receipt of payment from Owner, an amount equal to the percentage of completion allowed to Contractor on account of such subcontractor’s Work, less the percentage retained from payments to Contractor; PROVIDED, however, that Contractor shall make no payment to any subcontractor unless the subcontractor shall execute a waiver of liens in favor of Owner and Contractor reflecting the amount of each such payment. Contractor shall also require each

subcontractor to make similar payments to sub-subcontractors. All such payments shall be paid within the time limits.

5.5.2 If Owner fails to approve an Application for Payment for a cause which Owner and Architect determine is the fault of Contractor and not the fault of a particular subcontractor, or if Contractor fails to make payment which is properly due to a particular subcontractor, Owner may pay such subcontractor directly, less the amount to be retained under its Subcontract. Any amount so paid by Owner shall be repaid to Owner by Contractor. Owner shall have no obligation to pay or to see to the payment of any monies to any subcontractor. Nothing contained in Paragraph 5.5 shall be deemed to create any contractual relationship between Owner and any subcontractor or to create any rights in any subcontractor against Owner. Contractor shall promptly advise Owner of any claim or demand by a subcontractor claiming that any amount is due to such subcontractor or claiming any default by Contractor in any of its obligations to such subcontractor.

ARTICLE 6 – CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

Paragraph 6.1 – Owners Right to Perform Construction and to Award Separate Contracts

DELETE Subparagraph 6.1.3 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

6.1.3 It is the sole duty and responsibility of Contractor to plan, direct, perform and coordinate their Work as to cause no delay, hindrance, loss, injury, or similar damage to their subcontractors or suppliers. In the event Contractor causes any delay, hindrance, loss, injury, or similar damage to their subcontractors or suppliers, the aggrieved subcontractors or suppliers may pursue recovery of money damages against Contractor pursuant to Article 15. There shall be no claim asserted against Owner or Architect, or their respective directors, employees or agents for money damages based on the alleged acts or omissions with respect to coordinating, expediting or directing the Work. If Contractor prosecutes a claim against Owner or Architect for money damages or for an alleged failure to coordinate, expedite or direct the Work, then Contractor shall indemnify and hold harmless Owner and Architect against any and all costs, losses or expenses, including counsel fees, that Owner or Architect incur in responding to any such claim plus 10% interest per annum on all such costs from the date of occurrence of such costs up to the date of payment.

Paragraph 6.2 – Mutual Responsibility
Subparagraph 6.2.3

DELETE the second sentence of Subparagraph 6.2.3 in its entirety and, in lieu thereof, SUBSTITUTE the following new sentence:

[*Substitute:*] "Costs caused by delays, or by improperly timed activities or defective construction shall be borne by the responsible party therefore. Contractor shall indemnify Owner for any costs, damages or payments Owner incurs (including any payments to other contractors, Architect, legal

counsel, agents or consultants) arising from or relating to Work by Contractor that is not in compliance with the Contract Documents. Owner may withhold payments otherwise due to Contractor in the event of such indemnification duty

ADD the following new sentence to the end of Subparagraph 6.2.4:

ARTICLE 7 - CHANGES IN THE WORK

Paragraph 7.1 - General

Subparagraph 7.1.2

REVISE the first part of the first sentence of Subparagraph 7.1.2 to read as follows:

[*Revise:*] "A Change Order shall be based upon agreement among Owner and Contractor; a Construction Change Directive ……."

Subparagraph 7.1.3

DELETE Subparagraph 7.1.3 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

7.1.3 Before any Change Order is prepared, Contractor shall submit to Architect an itemized breakdown of the cost of the proposed Change in the Work. The term "cost" shall be interpreted to mean and include the actual cost of the following:

1. Labor, including foremen.
2. Materials at cost plus applicable taxes entering permanently into the Work.
3. Rental cost of construction plant and equipment, whether rented from Contractor or others.
4. Power and consumable supplies for the operation of power equipment.
5. Liability insurance and bonds.
6. Social security, old age and unemployment contributions.

When determining the labor costs of Work by Change Order, Contractor shall use the actual wage paid to the personnel performing the Work, and if requested by Owner or Architect, at any time during or after the project, Contractor shall provide certified payroll records necessary to evidence those labor costs. Using the actual wage paid to the personnel performing the Work, Contractor shall be entitled to fifteen percent (15%) of the total cost of the above for overhead, profit, supervision and miscellaneous expenses if they perform the Work with their own forces, or to the Subcontractor who performs the Work. In the case where the Work is performed by a subcontractor, Contractor may add five percent (5%) to the Subcontractor's total amount as Contractor's commission. Where Change Orders include both increases and decreases in the Contract Amount, the above fifteen percent (15%) will be allowed on the net increase only.

Paragraph 7.2 - Change Orders

Subparagraph 7.2.1

DELETE Subparagraph 7.2.1 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

7.2.1 A Change Order is a written instrument prepared by Architect and signed by Owner, Contractor and Architect. A Change Order is the only method by which the Contract Sum and/or the Contract Time may be adjusted. A Change Order shall provide for the following: (1) a change in the Work, if any; (2) the amount of the adjustment in the Contract Sum, if any; and (3) the extent of the adjustment in the Contract Time, if any.

ADD the following new Subparagraphs:

7.2.2 Contractor is responsible for submitting accurate cost and pricing data to support its proposals for change orders and other Contract price adjustments under the Contract Documents. Contractor shall certify in writing that to the best of its knowledge and belief, the cost and pricing data submitted is accurate, complete, current and in accordance with the terms of the Contract Documents with respect to pricing of change orders. Contractor shall also certify in writing that he has made reasonable good faith inquiries to appropriate individuals within its organization to confirm that the data submitted is accurate, complete and current. The above-described certification shall be required for all change order requests with a positive or negative value greater than $1,000.00. If it is later determined by audit or by other means that the cost and pricing data submitted is inaccurate, incomplete, not current or not in compliance with the terms of the Contract Documents regarding the pricing of change orders, then an appropriate contract price reduction shall be made.

7.2.3 Contractor shall perform the work of Change Orders only with personnel appropriate for the tasks performed. Should Contractor use overqualified personnel, Contractor shall only be entitled to payment for the work at the wage rate of the appropriate personnel, plus the applicable multipliers noted in 7.1.3.

7.2.4 Any Contractor creating the need for Additional Services by Architect, with respect to a Change Order, shall pay all costs associated with such Additional Services, and Architect shall prepare and present to Owner for approval, a Change Order or Construction Change Directive regarding such costs.

Paragraph 7.3 – Construction Change Directives
Subparagraph 7.3.2

ADD new Sub-subparagraph 7.3.2.1 as follows:

7.3.2.1 Any Contractor creating the need for Additional Services by Architect, with respect to a Construction Change Directive, shall pay all costs associated with such Additional Services, and Architect shall prepare and present to Owner for approval, a Change Order or Construction Change Directive regarding such costs.

ARTICLE 8 - TIME
Paragraph 8.1 – Definitions
Subparagraph 8.1.3

INSERT after “Architect”, the following:

[*Insert:*] "and approved by Owner"

Paragraph 8.2 – Progress and Completion
Subparagraph 8.2.2

DELETE the word "knowingly" from the first line.

Paragraph 8.3 – Delays and Extensions of Time
Subparagraph 8.3.1

DELETE (3) in its entirety and, in lieu thereof, SUBSTITUTE the following:

[*Substitute:*] "(3) by fire or adverse weather conditions documented in accordance with Section 15.1.6."

DELETE (4) in its entirety and, in lieu thereof, SUBSTITUTE the following:

[*Substitute:*] "(4) by delay authorized by Owner pending a proceeding pursuant to Article 15; or"

ADD the following new sentences to the end of Subparagraph 8.3.1:

[*Add:*] "All claims for extension of time shall be made, in writing, to Architect and Owner no more than seven (7) calendar days after the occurrence of the event causing the delay. If Contractor has caused Project delay, it shall be liable for, among other things, reimbursing Owner for any additional fees to Architect resulting from such delay.

Subparagraph 8.3.3

DELETE Subparagraph 8.3.3 in its entirety and, in lieu thereof, SUBSTITUTE the following:

8.3.3 Contractor recognizes that delays, acceleration or hindrances to the Work may occur. No claim or litigation for increased costs, charges, expenses or damages of any kind shall be filed by Contractor against Owner, Architect or Owner's Representative (or against any of their respective employees or agents) for any delays, acceleration, hindrances, or sequencing of work due to any cause whatsoever, notwithstanding whether such delays are caused by factors within or outside Contractor's control. Contractor's sole remedy for delays, acceleration, hindrances or sequencing of work shall be an extension of the Contract Time pursuant to this Paragraph 8.3. Should Contractor file any claim or litigation for money damages against Owner, Architect or Owner's Representative (including their employees or agents) in violation of this provision, such contractor shall provide indemnification for any costs incurred in the defense against such claim or litigation, including all fees by attorneys and experts, plus 10% interest per annum on all such costs from the date of occurrence of such costs up to the date of payment.

ADD new Paragraph 8.4 as follows:

Paragraph 8.4 – Liquidated Damages for Delays

8.4.1 **The amount of Liquidated Damages shall be $500 per day.**

8.4.2 The damages incurred by Owner due to Contractor's failure to complete the Work, (or any phase thereof, designated in the Project Schedule) by the Contract Time or the Specific Dates, including any extensions thereof under the Contract Documents, shall be in the amount set forth in the Contract Documents for each consecutive calendar day beyond each deadline for which Contractor shall fail to complete the Work or designated phase thereof.

8.4.3 Contractor agrees that the daily amount of liquidated damages provided in the Contract Documents shall not be considered a penalty, and further agrees not to challenge the lawfulness of such daily amount. The daily amount shall compensate Owner for Owner's inability to use or otherwise have available, Project or any phase thereof for its intended purpose by the Dates set forth in the Contract Documents. The assessment of liquidated damages shall not preclude Owner from additional recovery to which it is entitled under the Contract Documents or by law.

8.4.4 If, during the course of Contractor's performance of the Work, Contractor shall fail to complete the Work, or portions thereof, in accordance with Specific Dates or the Contract Time, Owner may retain the estimated amount of liquidated damages for which Contractor shall be liable to Owner under the Contract Documents, from amounts which become payable or are otherwise certified as payable to Contractor under the Contract Documents.

8.4.5 In the event that the Work must be conducted beyond the normal working hours specified or if the Project is not completed within the specified duration, Contractors shall indemnify Owner for any costs, damages or payments incurred by Owner, including payments to Architect, Clerk-of-the Works, or legal counsel.

8.4.6 If Contractor files any claim or litigation challenging an assessment of liquidated damages, or the daily or total amount of liquidated damages assessed, and does not prevail completely in such challenge, Contractor shall be liable to Owner for all costs incurred by Owner in defending against the challenge, including all fees of attorneys, architects and other consultants, and all time incurred by Owner's staff and administrators based on the burdened hourly compensation rates of Owner's employees.

ARTICLE 9 - PAYMENTS AND COMPLETION
Paragraph 9.1 Contract Sum
Subparagraph 9.1.2

ADD the following new Sub-subparagraphs:

9.1.2.1 Owner reserves the right to accept or reject any and all Unit Prices stipulated on the Bid Form.

9.1.2.2 If quantities originally contemplated are materially changed so that application of a unit price will cause a substantial inequity to Owner or Contractor, Owner reserves

the right to equitably adjust the Unit Price or to require that the work be performed on a time and material basis.

Paragraph 9.2 – Schedule of Values

ADD new Subparagraph 9.2.1 as follows:

9.2.1 Refer to Division 1 Section, "Applications for Payment" for requirements regarding the schedule of values.

ADD new Subparagraph 9.2.2 as follows:

9.2.2 The Schedule of Values shall be prepared in such a manner that each major item of Work and each subcontracted item of Work is shown as a line item on AIA Document G703, Application and Certificate for Payment Continuation Sheet. Each major item of Work shall be further broken down into separate line items for work done in each area of the building, site and each phase of construction. Each work item shall be broken down into separate line items for material and labor. Each line item shall include quantities and unit prices in such detail as required by Architect.

Paragraph 9.3 - Applications for Payment
Subparagraph 9.3.1

DELETE Subparagraph 9.3.1 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

9.3.1 At least fifteen (15) days before the date established for each progress payment, Contractor shall submit to Architect an itemized Application for Payment for Work completed in accordance with the Contract Documents. Such application shall be notarized and supported by such data substantiating Contractor's right to payment as Owner or Architect may require, such as copies of requisitions, and releases and waiver of liens from subcontractors and suppliers and reflecting retainage.

Notwithstanding the language in §9.10.5 or any other section hereof, before Owner shall have any obligation to release any payments for Work completed to Contractor, Contractor shall deliver an executed and notarized "Partial Waiver and Release of Mechanics Lien Claims" in the form provided. The partial waiver of liens shall waive Contractor's right to file a lien against the Property or Owner for an amount equal to the payment received by Contractor at that time.

Contractor shall obtain and post a bond guaranteeing payment for labor and materials provided by subcontractors in an amount, form and a surety acceptable to Owner.

Contractor acknowledges that Owner may file with the Office of the Prothonotary of Fluvanna County, the relevant provisions of the Contract containing the total amount of the Contract price and Contractor acknowledges that it is aware of the total Contract price.

Contractor hereby agrees that it will defend, indemnify and hold harmless Owner from and against any mechanics' lien or claim filed by any subcontractor by reason of Contractor's failure to pay the Subcontractor any amount owed to such Subcontractor. Contractor shall prevent the filing of any mechanics' lien, or should a lien be filed, Contractor shall undertake any and all action necessary to remove said lien. Any failure of Contractor in any of its obligations in this §9.3.1 shall constitute a material breach of this Contract. Furthermore, Contractor shall be obligated to pay Owner all of Owner's costs incurred in defending or removing any such mechanics' lien whether filed by Contractor or any subcontractor. This shall include payment of all of Owner's attorney's fees, whether incurred in removing or challenging any mechanics' lien claim filed by Contractor or any subcontractor, or in enforcing Contractor's obligations hereunder.

Owner shall retain ten percent (10%) of all amounts due Contractor until the Work is fifty percent (50%) completed. When the Work is fifty percent (50%) completed, at the sole discretion of Owner, one-half of the amount retained by Owner may be returned to Contractor, provided Contractor provides written consent of surety to such reduction in retainage to Owner along with its Application for Payment, provided Architect approved the application and reduction of retainage, and further provided that Contractor is making satisfactory progress and there is no specific cause for greater withholding.

If Owner reduces the retainage as stated above, Owner shall then retain five percent (5%) of all amounts due Contractor after the Work is fifty percent (50%) completed. The retained percentage will be paid on with the final Payment or as otherwise provided hereafter. In the event a dispute arises between Owner and Contractor, which dispute is based upon increased costs claimed by Contractor occasioned by damages or other actions of another contractor, additional retainage, in the sum of one and one half times the amount of any possible liability, may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless Contractor causing the additional claim furnishes an additional bond satisfactory to Owner to indemnify Owner against the claim.

The full Contract retainage may be reinstated if the manner of completion of the Work and its progress do not remain satisfactory to Owner or Architect or if Surety withholds its consent or for other good and sufficient reasons.

ADD new Sub-subparagraph 9.3.1.3 as follows:

9.3.1.3 Refer to Division 1 Section "Applications for Payment" for additional requirements regarding applications for payment.

Paragraph 9.4 - Certificates for Payment
Subparagraph 9.4.2

DELETE the words "the quality of" from the third line.

CHANGE the words "an evaluation" to "future evaluations" in the fifth line.

DELETE the words "upon Substantial Completion" from the sixth line.

Paragraph 9.5 - Decisions to Withhold Certification
Subparagraph 9.5.1

DELETE the first sentence of Subparagraph 9.5.1 and, in lieu thereof, SUBSTITUTE it with the following:

[*Substitute:*] "Architect shall not certify payment and shall withhold a Certificate for Payment in whole or in part to the extent necessary to protect Owner."

REVISE the following Sub-subparagraphs as follows:

9.5.1.2 DELETE the word "reasonable".
9.5.1.4 DELETE the word "reasonable".
9.5.1.6 DELETE the word "reasonable".
9.5.1.7 DELETE the word "repeated".

ADD the following new Sub-subparagraphs:

9.5.1.8 Unsatisfactory prosecution of the Work in accordance with the Contract Documents.
9.5.1.9 Failure to comply with any statute, ordinance regulation or other legal requirement.
9.5.1.10 Failure to submit progress schedule updates as required by the Contract Documents.
9.5.1.11 Failure to submit wage certification as required by the Contract Documents.
9.5.1.12 Failure to submit a Schedule of Values that is acceptable to Architect.

Paragraph 9.6 – Progress Payments
Subparagraph 9.6.1

ADD "and Owner has approved" AFTER "the Architect has issued," AND DELETE "and shall so notify Architect."

Subparagraph 9.6.7

DELETE Subparagraph 9.6.7 in its entirety.

Paragraph 9.7 – Failure of Payment

DELETE Subparagraph 9.7 and, in lieu thereof, SUBSTITUTE the following new Subparagraph:

9.7 If Owner does not pay Contractor within thirty (30) days after the date established in the Contract Documents, the amount certified by Architect and approved by Owner or awarded by dispute resolution, then Contractor may, upon seven additional days' written notice to Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract time shall be extended appropriately .

Paragraph 9.8 – Substantial Completion
Subparagraph 9.8.1
DELETE Subparagraph 9.8.1 in its entirety and, in lieu thereof, SUBSTITUTE it with the following:

9.8.1 Substantial Completion of Project shall be deemed to occur when Architect determines and Owner approves that the Work, or designated phase thereof, is sufficiently complete

in accordance with the Contract Documents so Owner can occupy or utilize the Work for its intended use, and in addition, all requirements of the Contract Documents for Substantial Completion have been fulfilled.

Subparagraph 9.8.2

DELETE the words "prior to final payment." from Subparagraph 9.8.2 and, in lieu thereof, SUBSTITUTE them with the following:

[*Substitute:*] "within 30 days of the date of Substantial Completion."

ADD new Sub-subparagraph 9.8.2.1 as follows:

9.8.2.1 Definition: Contractor's comprehensive list of items to be completed or corrected shall be referred to as the "Punch List." The Punch List shall be prepared by Contractor on the form provided in Division 1 Section "Contract Closeout", or in an electronic format acceptable to Architect, (i.e., Bluebeam, PlanGrid, etc,)

Subparagraph 9.8.4

ADD after "that shall" in the first sentence "upon approval by Owner" AND ADD at the end of the subparagraph "or in the Contract Documents."

Subparagraph 9.8.5

ADD new Sub-subparagraph 9.8.5.1 as follows:

9.8.5.1 Owner's retainage upon Substantial Completion shall be the greater of (a) 5% of the Contract Sum adjusted by Change Orders, or (b) the amount necessary to protect Owner's interests, a minimum of 150% of Architect's estimated cost to complete or correct Work at the time of Substantial Completion.

Paragraph 9.10 - Final Completion and Final Payment
Subparagraph 9.10.2

ADD after the words "shall become due until" in the first sentence, "Owner approves such payment and"

ADD new Subsections (7) and (8) to the end of the first sentence:

[*Add:*] "(7) Final as-built prints of record drawings marked by Contractor with record information as set forth in the Contract Documents, and (8) A final sworn statement from Contractor duly executed and acknowledged showing all subcontractors to be fully paid and similar final sworn statements from subcontractors and, where appropriate, from sub-subcontractors.

Subparagraph 9.10.3

DELETE Subparagraph 9.10.3 in its entirety.

Subparagraph 9.10.4

DELETE Subparagraph 9.10.4 in its entirety and, in lieu thereof, SUBSTITUTE the following:

[*Substitute:*] "The making of final payment by Owner shall not constitute a waiver or release of any claim by Owner."

Subparagraph 9.10.4

ADD the following new Sub-subparagraphs:

9.10.4.5 Latent failures of Contractor to comply with the requirements of the Contract Documents.

9.10.4.6 Architect's fees resulting from re-inspections due to Contractor's failure to satisfactorily, fully and finally complete the Work or legal and accounting costs and expenses arising therefrom.

9.10.4.7 Architectural fees for services (60) days after the date of Substantial Completion shall be borne by the responsible contractor.

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

Paragraph 10.2 - Safety of Persons and Property

Subparagraph 10.2.1

ADD the word "all" after the word "take" in the first line.

Subparagraph 10.2.5

DELETE "(other than damage or loss insured under property insurance required by the Contract Documents)"

ADD new Subparagraph 10.2.9 as follows:

10.2.9 Contractor shall promptly report in writing to Owner and Architect all accidents, other than minor accidents for which no medical treatment is required, arising out of, or in connection with the Work which cause death, personal injury or property damage, giving full details and statements of any witnesses whether or not Owner has actual knowledge of the accident. In addition, if death or serious personal injuries or serious damage are caused, the accident shall be reported immediately by telephone or messenger to Owner and Architect.

ARTICLE 11 - INSURANCE AND BONDS

DELETE All Paragraphs for Article 11 in their entirety, and in lieu thereof, ADD the following:

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:

11.1.1.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;

11.1.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

11.1.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

11.1.1.4 Claims for damages insured by usual personal injury liability coverage;

11.1.1.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

11.1.1.6 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;

11.1.1.7 Claims for bodily injury or property damage arising out of completed operations; and

11.1.1.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

11.1.2 The insurance required by Fluvanna County 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. Where Owner's and Contractor's/Subcontractor's policies each apply, Contractor's/Subcontractor's policies shall be considered primary.

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 Fluvanna County 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 Fluvanna County. 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 and Architect, 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 Contractor or contractors making the claim shall be responsible for paying all costs not covered because of any deductibles required by the insurer or insurers underwriting the builder's risk policy defined in Paragraph 11.3.1. The amount of the deductible for the builder's risk policy is $5,000, which shall be on a per occurrence basis.

11.3.1.4 Owner's builder's risk policy will cover a claim for stored materials, or materials in transit, up to a maximum value of $250,000. Within 60 days of award of the Contract, Contractor shall be responsible to advise Owner in writing if this amount is insufficient to protect Owner against this potential risk, so that Owner can revise their policy accordingly. If Contractor fails to notify Owner in writing, the amount stated above shall be deemed to be sufficient.

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.

11.3.1.6 Owner shall limit the deductible for the builder's risk policy defined in this Paragraph 11.3.1.

11.3.2 Boiler and Machinery Insurance:

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

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. The Owner's loss of use damages are limited to the amount paid under the Loss of Use policy.

11.3.3.1 The Contractor and all subcontractors shall be named as additional insureds on the Owner's Loss of Use policy.

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 . 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 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 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. 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 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 Contractor shall provide bonds in accordance with the provisions of the Virginia Public Procurement Act and in so doing shall provide:

(a) A Performance Bond at one hundred percent (100%) of the Contact amount, conditioned upon the faithful performance of the Contractor in accordance with the plans, specifications and conditions of the Contract. Such bond shall be solely for the protection of the Owner or assignee as authorized in accordance with the provisions of Paragraph 13.2.1 herein.

(b) A Payment Bond at one hundred percent (100%) of the Contract amount. Such bond shall be solely for the protection of claimants supplying labor or materials to the Contractor or to any of their Subcontractors in the prosecution of the Work provided for in the Contract Documents and shall be conditioned for the prompt payment of all such material furnished or labor supplied or performed in the prosecution of the Work. "Labor or Materials" shall include public utility services and reasonable rentals of equipment, but only for periods when the equipment rented is actually used at the site.

(c) A Maintenance Bond providing additional coverage in the full amount of the Contract Sum insuring against defective or inferior materials or workmanship which may develop during the period of one (1) year from the date of Final Completion of the Project.

(d) Each of such bonds required by the Contract Documents shall be executed by one or more surety companies legally authorized to do business in the Commonwealth of Virginia and not otherwise objectionable to the Owner. The surety of whom the Contractor has purchased bonds shall have an "A-" or better rating, plus a financial

rating of VI or better with the A. M. Best's Company (Key Rating Guide – Latest Edition) and listed in the Department of Treasury Circular 570, with a capacity which meets or exceeds the contract amount. The bond shall be payable to the Owner or assignee as provided for in Paragraph 13.2.1

Both a Performance Bond and Payment Bond shall be required as specified under Article 7 of the Supplementary Instructions to Bidders.

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
Paragraph 12.2 - Correction of Work

Subparagraph 12.2.2 After Substantial Completion
Sub-subparagraph 12.2.2.1

DELETE the following from the first sentence and, in lieu thereof, SUBSTITUTE the following:

[*Delete:*] "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"

[*Substitute:*] "if, within one (1) year after the date of Final Completion of the Work or within one (1) year from the date of Partial Occupancy or Use of designated phases thereof (whichever shall first occur) or after the date for commencement of warranties"

DELETE sub-subparagraph 12.2.2.3 in its entirety and, in lieu thereof, SUBSTITUTE the following new sub-subparagraph:

12.2.2.3 In the event any Work, material or equipment is replaced or repaired as a consequence of latent defects or failure to meet the terms of the Contract Documents, all warranties with respect to such Work, material or equipment replaced or repaired shall continue following repair or replacement of such Work, material or equipment for an additional period equivalent to the original period of warranty for such Work, material or equipment.

ARTICLE 13 - MISCELLANEOUS PROVISIONS
Paragraph 13.1 – Governing Law

DELETE the remainder of the sentence after the word "located".

REPLACE "the Federal Arbitration Act" with "unless the parties mutually agree otherwise, the rules of the American Arbitration Association"

Subparagraph 13.3.2

REPLACE “Owner, Architect or Contractor” with “Owner or Architect”

Paragraph 13.4 - Tests and Inspections
Subparagraph 13.4.1

DELETE Subparagraph 13.4.1 in its entirety and, in lieu thereof, SUBSTITUTE the following new subparagraph:

13.4.1 If the Contract Documents or any laws, statutes, ordinances, building codes, rules, regulations or orders of any governmental body or public or quasi-public authority having jurisdiction over the work or the site of the Project require any portion of the Work to be inspected, tested or approved, Contractor shall give Architect and Owner timely notice thereof so Architect and Owner may observe such inspection, test or approval.

Subparagraph 13.5 – Interest

DELETE Subparagraph 13.5 in its entirety.

ADD new Paragraph 13.6 as follows

Paragraph 13.6 Tax Credits

13.6 The Project, or part or all of the Project or Work, may qualify for tax benefits arising from or related to the energy efficiency, energy efficiency rating, or energy efficiency score assigned to the Project or Work by the relevant taxing authority. These tax benefits include, without limitation, Internal Revenue Code §179.D and other federal, state or local tax benefits, as established by those authorities having jurisdiction over such benefits (hereinafter the “Tax Benefits”). These Tax Benefits may take various forms, including without limitation, accelerated depreciation for commercial, multifamily, and publically owned facilities. The Tax Benefits may be assignable by Owner to third parties, as provided for by the statutes, rules and regulations governing such Tax Benefits. Notwithstanding any other language contained in any of the Contract Documents, no Contractor or subcontractor shall, under any circumstances, apply for, request, receive, accept or retain any Tax Benefit arising from or related to the Project, Work, or any part of the Project or Work.

Paragraph 13.7 – Time Limits on Claims
Subparagraph 13.7

DELETE the remainder of the first sentence after the word “Contract” in line two.

Paragraph 13.7 - Time Limits on Claims

DELETE Paragraph 13.7 in its entirety and, in lieu thereof, SUBSTITUTE the following new Paragraph:

13.7 As between Owner and Contractor, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued as provided by the laws of the Commonwealth of Virginia. Nothing herein shall be deemed to have

caused any applicable statute of limitations to commence to run or any alleged cause of action to have accrued in the event of any latent defect upon actual discovered until after the issuance of the final certificate for payment. Any applicable statute of limitations shall commence on any cause of action related to an alleged latent defect upon actual discovery of such latent defect. Owner reserves all rights and privileges applicable to it pursuant to the doctrine of *nullum tempus occurrit regi.*

ADD new Paragraph 13.8 as follows:

Paragraph 13.8 Tax Credits

13.8 The Project, or part or all of the Project or Work, may qualify for tax benefits arising from or related to the energy efficiency, energy efficiency rating, or energy efficiency score assigned to the Project or Work by the relevant taxing authority. These tax benefits include, without limitation, Internal Revenue Code §179.D and other federal, state or local tax benefits, as established by those authorities having jurisdiction over such benefits (hereinafter the "Tax Benefits"). These Tax Benefits may take various forms, including without limitation, accelerated depreciation for commercial, multifamily, and publically owned facilities. The Tax Benefits may be assignable by Owner to third parties, as provided for by the statutes, rules and regulations governing such Tax Benefits. Notwithstanding any other language contained in any of the Contract Documents, no Contractor or subcontractor shall, under any circumstances, apply for, request, receive, accept or retain any Tax Benefit arising from or related to the Project, Work, or any part of the Project or Work.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

Paragraph 14.1 - Termination by the Contractor

DELETE Paragraph 14.1 in its entirety.

Paragraph 14.2 - Termination by the Owner for Cause
Subparagraph 14.2.1

DELETE Subparagraph 14.2.1 in its entirety and, in lieu thereof, SUBSTITUTE the following:

14.2.1 Owner may terminate the Contract if Contractor:

.1 shall institute proceedings or consent to proceedings requesting relief or arrangement under the Federal Bankruptcy Code or any similar or applicable federal or state law; or if a petition under any federal or state bankruptcy or insolvency law is filed against Contractor and such petition is not dismissed within sixty (60) days from the date of said filing; or if Contractor admits in writing, its inability to pay its debts generally as they become due, or if it makes a general assignment for the benefit of its creditors, or if a receiver, liquidator, trustee or assignee is appointed on account of its bankruptcy or insolvency; or if a receiver of all or any substantial portion of Contractor's properties is appointed.

.2 abandons the Work; or if it fails, except in cases for which an extension of time is provided, to prosecute promptly and diligently the Work or to supply enough properly skilled workers or proper materials for the Work;

.3 submits an Application for Payment, sworn statement, affidavit or document of any nature whatsoever which is intentionally falsified;

.4 fails to make prompt payment to subcontractors or for materials or labor or otherwise breaches their obligations under any subcontract with a subcontractor; or if a materialman's lien or notice of lien is filed against any party of the Work or the site of the Project and not promptly bonded or insured over by Contractor in a manner satisfactory to Owner;

.5 disregards any laws, statutes, ordinances, rules, regulations or orders of any governmental body or public or quasi-public authority having jurisdiction of the Work or the site of the Project;

.6 otherwise violates any provision of the Contract Documents; then Owner, upon the occurrence of the events described in clauses .1 through .5 above, without prejudice to any right or remedy available to Owner under the Contract Documents or at law or in equity may, after giving Contractor and its surety under the Performance Bond and under the Labor and Material Payment Bond, if any, seven (7) days written notice, terminate the employment of Contractor and, in accordance with the Uniform Commercial Code, may enforce a Security Agreement by taking possession of and using all or any part of Contractor's materials, equipment, supplies and other property of every kind used by Contractor in the performance of the Work in the completion of the Work. If requested by Owner, Contractor shall remove any part or all of its equipment, machinery and supplies from the site of the Project within seven (7) days from the date of such request, and in the event of Contractor's failure to do so, Owner shall have the right to remove or store such equipment, machinery and supplies at Contractor's expense. In case of such termination, Contractor shall not be entitled to receive any further payment for Work performed by the Contract through the date of termination. Owner's right to terminate Owner-Contractor Agreement pursuant to this Subparagraph 14.2.1 shall be in addition to and not in limitation of any rights or remedies existing hereunder or pursuant hereto or at law or in equity.

Subparagraph 14.2.4

DELETE Subparagraph 14.2.4 in its entirety and, in lieu thereof, SUBSTITUTE the following new Subparagraph 14.2.4:

14.2.4 If the unpaid balance of the Contract Sum exceeds all costs to Owner of completing the Work, then Contractor shall be paid for all Work performed by Contractor to the date of termination. If such costs to Owner of completing the Work exceed such unpaid balance, Contractor shall pay the difference to Owner upon Owner's demand. The costs to Owner of completing the Work shall include, but not be limited to, the cost of any additional architectural, legal, managerial and administrative services required thereby, any costs incurred in retaining another contractor or other subcontractors, any additional interest or fees which Owner must pay by reason of a delay in completion of the Work, attorneys' fees and expenses and any other damage, costs and expenses

Owner may incur by reason of completing the Work. The amount, if any, to be paid to Contractor shall be certified by Architect upon application, in the manner provided in Paragraph 9.4, and this obligation for payment shall survive the termination of the Contract.

Paragraph 14.3 - Suspension by Owner for Convenience
Subparagraph 14.3.1

ADD the following new sentence to the end of Subparagraph 14.3.1:

[*Add:*] Any suspension by Owner for convenience does not constitute grounds for termination by Contractor under Section 14.1.

Subparagraph 14.4.3

DELETE the remainder of the subparagraph after the words "for Work properly executed."

ADD new Paragraph 14.5 as follows:

Paragraph 14.5 Indemnification

14.5 Contractor and each subcontractor shall indemnify and hold harmless, Owner, its officers, directors, agents, and employees, Architect and its officers, directors, agents and employees, and each of them, as "indemnitee", from and against any and all fines, penalties, losses, costs, damages, injuries, expenses, claims, liens, encumbrances and/or liabilities (individually and collectively referred to herein as "liabilities") arising out of, or resulting from (a) any claim for any service or goods allegedly infringed, including without limitation any patent, copyright, trademark, service mark, trade secret or other legally-protected proprietary right; and (b) the Work as described in the Contract Documents, including, but not limited to, any claim of injury (including death) to persons or damage to property, and contamination of, or any adverse impact upon the environment, except to the extent that any such claim is finally found by the court or arbitration entity by which such claims are finally resolved, to have arisen from the willful misconduct of the indemnitee. A finding of "willful misconduct" as against one indemnitee shall not nullify the indemnification provided to any other indemnitee who is not found to have performed any willful misconduct. As used herein, "willful misconduct" shall mean gross negligence or any intentional criminal act. Owner shall notify Contractor of any suit or legal proceeding asserting a claim for liabilities. Contractor and subcontractors shall, at no cost to any indemnitee, defend and/or settle such suit or legal proceeding, or judgment, including any appellate proceeding, asserting a claim for liabilities. Contractor and subcontractors shall pay any costs and legal fees incurred by any indemnitee in connection with any liabilities, whether or not litigation is actually commenced, and shall keep indemnities informed as to the progress of the defense. If requested by an indemnitee, Contractor and subcontractors shall afford indemnities the opportunity to participate in the defense or settlement of any claim. With regard to any claim of infringement as referred to herein, Contractor and Subcontractors shall procure the right to continue using the services or goods, or at the indemnities' option, replace or modify the services or goods to make them non-infringing services or goods.

ARTICLE 15 – CLAIMS AND DISPUTES

Paragraph 15.1 - Claims

Subparagraph 15.1.1 - Definition

ADD the following new sentence to the end of Subparagraph 15.1.1:

[*Add:*] All Claims as defined in §15.1.1, and any other claim or dispute between Contractor and Owner or Architect, including without limitation those claims set forth in §15.3, shall be governed by this Article 15.

Subparagraph 15.1.2 – Time Limits on Claims

DELETE the remainder of the first sentence after the word "Agreement" in the third line.

Subparagraph 15.1.2 - Time Limits on Claims

DELETE Subparagraph 15.1.2 in its entirety and, in lieu thereof, SUBSTITUTE the following new Paragraph:

15.1.2 As between Owner and Contractor, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued as provided by the laws of the Commonwealth of Virginia. Nothing herein shall be deemed to have caused any applicable statute of limitations to commence to run or any alleged cause of action to have accrued in the event of any latent defect upon actual discovered until after the issuance of the final certificate for payment. Any applicable statute of limitations shall commence on any cause of action related to an alleged latent defect upon actual discovery of such latent defect. Owner reserves all rights and privileges applicable to it pursuant to the doctrine of *nullum tempus occurrit regi.*

Subparagraph 15.1.3 – Notice of Claims

Sub-subparagraph 15.1.3.1

DELETE ", where the condition giving rise to the claim is first discovered prior to expiration of the period of correction of the Work set forth in Section 12.2.2," from the first sentence.

CHANGE "either party" to "Contractor" in the second sentence.

CHANGE "claimant" to "Contractor" in the last sentence.

Sub-subparagraph 15.1.3.2

DELETE Sub-subparagraph 15.1.3.2 in its entirety.

Subparagraph 15.1.5 – Claims for Additional Time

ADD the following new Sub-subparagraphs:

15.1.5.3 In planning the construction schedule within the agreed Contract Time, it shall be assumed that Contractor has anticipated the amount of adverse weather conditions normal to the site of the Work for the season or seasons of the year involved. Only those weather delays attributable to other than normal weather conditions will be considered.

15.1.5.4 The following Standard Baseline of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the baseline for monthly weather time evaluations. "Standard Baseline" is defined as the normal number of calendar days for each month during which construction activity exposed to weather conditions is expected to be prevented and suspended by cause of adverse weather. "Adverse Weather" is defined as the occurrence of one or more of the following conditions within a twenty-four (24) hour day that prevents construction activity exposed to the weather conditions or access to the site:

1. Precipitation (rain, snow, or ice) in excess of 1/10 inch liquid measure.
2. Temperatures that did not rise above that required for the day's construction activity, if such temperature requirement is specified or accepted as standard industry practice.
3. Sustained wind in excess of 25 mph.

15.1.5.5 Contractor's Construction Schedule must reflect the following anticipated adverse weather delays in all weather dependent activities.

Standard Baseline

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
14	7	7	8	8	7	4	5	4	4	5	7

15.1.5.6 Upon acknowledgement of the Notice to Proceed and continuing throughout the Contract, Contractor will record in a daily log the occurrence of adverse weather and resultant impact to normally scheduled Work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of Contractor's scheduled work day in order to constitute an adverse weather delay day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in a previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in sub-subparagraph 15.1.5.5 above, Architect will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a no-cost Change Order for additional days, to be executed by Owner, Architect and Contractor. This no-cost Change Order shall be the sole remedy for delays associated with weather.

Subparagraph 15.1.7 – Waiver of Claims for Consequential Damages

DELETE Subparagraph 15.1.7, including both sub-subparagraphs, in its entirety, and in lieu thereof, SUBSTITUTE the following subparagraph:

15.1.7 Contractor waives Claims against Owner for consequential damages arising out of or relating to this Contract, including but not limited to waiving any claims for damages incurred by Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit.

Subparagraph 15.1.8 – Owner as a Contracting Body

ADD new Subparagraph 15.1.8 as follows:

15.1.8 Contractor agrees and acknowledges that Owner is a “contracting body” under the Public Works Contractors’ Bond Law of 1967 (the “Bond Law”), and the Work on the Project is public construction and not subject to the filing of Mechanics Liens, and further agrees to provide and specify in its subcontracts with subcontractors for their acknowledgment that their sole remedy against Owner exists only under the provisions of the Bond Law and in accordance with the Payment Bond.

Paragraph 15.2 – Initial Decision

Subparagraph 15.2.1

Due to the new modified language for Article 11, in first sentence of subparagraph 15.2.1 REPLACE reference to Section 11.5 to Section 11.3.

Paragraph 15.2 – Initial Decision
Subparagraph 15.2.1

DELETE the last sentence of Subparagraph 15.2.1 in its entirety.

Subparagraph 15.2.2

After the word "compromise" in the third line, DELETE the remainder of the subparagraph and, in lieu thereof, SUBSTITUTE with the following: ", (5) request additional time to decide the Claim, or (6) advise the parties that the Initial Decision Maker is unable to resolve the Claim. If none of the foregoing actions are taken timely with regard to a Claim by Contractor, the Claim shall be deemed to be denied. If none of the foregoing actions are taken timely with regard to a Claim by Owner, the Claim shall be deemed to be granted."

Subparagraph 15.2.4

ADD the following to the end of the subparagraph: "Any failure by Contractor to timely provide requested information shall not delay a decision on the Claim."

Subparagraph 15.2.5

REPLACE "subject to mediation" with "subject to mediation upon agreement of all parties involved in the dispute"

ADD the following to the end of the subparagraph: "pursuant to this Article 15."

Subparagraph 15.2.6

DELETE Subparagraph 15.2.6, along with its sub-subparagraph 15.2.6.1, in its entirety.

Subparagraph 15.2.7

DELETE Subparagraph 15.2.7 in its entirety.

Subparagraph 15.2.8

ADD new Sub-subparagraph 15.2.8.1 as follows:

15.2.8.1 Contractor agrees and acknowledges that Owner is a “contracting body” under the Public Works Contractors’ Bond Law of 1967 (the “Bond Law”), and the Work on the Project is public construction and not subject to the filing of Mechanics Liens, and further agrees to provide and specify in its subcontracts with subcontractors for their acknowledgment that their sole remedy against Owner exists only under the provisions of the Bond Law and in accordance with the Payment Bond.

Paragraph 15.3 - MEDIATION
Subparagraph 15.3.1

DELETE Subparagraph 15.3.1 in its entirety, and in lieu thereof, SUBSTITUTE the following new Subparagraph:

15.3.1 "Any claim, dispute or other matter in question arising out of or related to the Contract Documents shall be subject to mediation only if all involved parties agree to pursue mediation."

Subparagraph 15.3.2

DELETE Subparagraph 15.3.2 in its entirety.

Subparagraph 15.3.4

ADD the following at the beginning of Subparagraph 15.3.4: "If all parties involved in a dispute agree to mediate,"

ADD the following new Subparagraph:

15.3.5 Owner shall have the right, at any time after any Claim is raised against Owner, to waive mediation or arbitration, and such election shall be binding on Contractor, and may be made by Owner at any time prior to the entry of a final award by the Arbitrator. In such event, a Claim arising under this Agreement shall be subject to a bench trial in the General District Court of Fluvanna County, and the parties waive the right to a jury in such proceeding. If any claim is brought by any Contractor as against Architect only, Architect shall have the right, at any time after any Claim is raised against Architect, to waive mediation or arbitration, and such election shall be binding on Contractor, and such election may be made by Architect at any time prior to the entry of a final award by the Arbitrator. In such event, any such Claim shall be subject to a bench trial in the General District Court of Fluvanna County, and the parties waive the right to a jury in such proceeding.

Paragraph 15.4 – Arbitration

DELETE Paragraph 15.4, including all subparagraphs and sub-subparagraphs of 15.4, except as noted below under 15.4.4.2 and 15.4.4.3.

Subparagraph 15.4.4 – Consolidation and Joinder

DELETE sub-subparagraphs 15.4.4.2 and 15.4.4.3 in their entirety, and in lieu thereof, SUBSTITUTE them with the following new sub-subparagraphs.

15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in binding dispute resolution, provided that the party sought to be joined consents in writing to such joinder.

15.4.4.3 Owner and Contractor grant to any person or entity made a party to binding dispute resolution conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as Owner and Contractor under this Agreement.

Paragraph 15.4 – Arbitration

DELETE Paragraph 15.4, including all subparagraphs and sub-subparagraphs of 15.4, in its entirety and, in lieu thereof, SUBSTITUTE the following:

15.4 Dispute Resolution

15.4.1 Controversies and Claims. Any controversy or claim arising out of or related to the Contract or the breach thereof, or the Work or the Project shall be resolved through binding arbitration at the option of Owner or otherwise through non-jury trial proceedings in the County of Fluvanna General District Court. Contractor, for itself and each Subcontractor, hereby (a) waives any right which may exist to a jury trial and (b) hereby agrees that all trials be heard by a judge sitting without a jury.

15.4.2 If Owner elects arbitration it must do so either before initiating litigation or within 30 days of service or original process of litigation upon Owner. Owner's demand for arbitration must be filed in writing with the American Arbitration Association and with any other party to be included in the arbitration. All parties necessary for resolution of the dispute in controversy shall be included in the arbitration. The Construction Industry Arbitration Rules of the American Arbitration Association then in effect shall apply to the arbitration, except for rules on discovery where the following sub-paragraph shall apply.

15.4.3 In any arbitration proceeding commenced pursuant to this Agreement, the parties shall be entitled to conduct pre-hearing discovery for a period of ninety (90) days, which discovery may include depositions, written requests for the inspection and reproduction of relevant documents or tangible things. Responses to written interrogations and document requests shall be served within thirty (30) days of service thereof. With respect to expert testimony and discovery related thereto. The arbitrator(s) shall have the authority to issue appropriate orders to enforce the parties' entitlement to discovery hereunder and, upon disobedience of any such order, may prohibit the disobedient party from introducing in evidence designated documents, thing or testimony.

15.4.4. Should any Contractor bring a claim against Owner or Architect, then, unless Contractor prevails on such Claim against Owner or Architect, Contractor shall be liable to Owner and Architect for all of Owner's and Architect's costs in having all such claims dismissed, or in defending all such claims, or both. These costs shall include all of Owner's or Architect's costs, including without limitation personnel costs, attorney fees, expert fees, fees of Architect and Owner's Representative, travel expenses, and the like.

Paragraph 15.4 – Arbitration

ADD the following new Sub-sub paragraphs as follows:

15.4.1.2 In any arbitration proceeding commenced pursuant to this Paragraph 15.4, the parties shall be entitled to conduct pre-hearing discovery for a period of ninety (90) days, which discovery may include depositions, written interrogations not to exceed forty (40) in number (inclusive of subparts) and written requests for the inspection and reproduction of relevant documents or tangible things. Responses to written interrogations and document requests shall be served within thirty (30) days of service thereof. With respect to expert testimony and discovery related thereto. The arbitrator(s) shall have the authority to issue appropriate orders to enforce the parties' entitlement to discovery hereunder and, upon disobedience of any such order, may prohibit the disobedient party from introducing in evidence designated documents, things, or testimony.

15.4.1.3 The award rendered by the arbitrator(s) shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

15.4.1.4 Contractor acknowledges that the mediation and arbitration procedures outlined in paragraphs 15.3 and 15.4 hereof shall be Contractor's exclusive remedies with regard to claims against Owner or Architect, subject to Owner's and Architect's rights to elect to forego mediation or arbitration.

15.4.1.5 Should any Contractor bring a claim against Owner or Architect, then, unless the fact finder finds that Contractor had a good faith basis for the claim against Owner or Architect, Contractor shall be liable to Owner and Architect for all of Owner's and Architect's costs in having all such claims dismissed, or in defending all such claims, or both. These costs shall include all of Owner's or Architect's costs, including without limitation personnel costs, attorney's fees, expert fees, travel expenses, and the like.

ADD new Paragraph 15.5 as follows:

15.5 - Scheduling and Completion

15.5.1 By execution of the Agreement, Contractor agrees to the following:

.1 Owner and Architect are not responsible for delays arising from or related to any act or omission of Contractor. Owner and Architect are not responsible for any costs or damages arising from or related to Contractor's coordination and scheduling of its Work. Owner and Architect are not liable for any costs or damages suffered by Contractor arising from or related to Contractor's coordination of its Work. Contractor hereby waives and releases and indemnifies Owner and Architect from any liability and damages arising from or related to coordination by Contractor of the Work.

.2 Architect and Owner and their representatives shall not be liable to Contractor for any increased costs or damages for defective work. These costs shall include all of Owner's or Architect's costs, including without limitation personnel costs, attorney's fees, expert fees, travel expenses, and the like.

.3 It is agreed by Contractor that no dispute shall delay completion of the Work, which shall be continued by Contractor pending final resolution of a claim, including without limitation, judicial proceedings.

.4 It is agreed by the parties to this Contract that the intent of this Paragraph 15.5.1 is to benefit Owner and Architect, and Owner's interests, and that the provisions of the Contract Documents.

.5 Contractor specifically releases, foregoes and waives any claims against Owner or Architect for extended overhead, delay damages, "impact" damages, loss of efficiency, loss of productivity, lost profit, or any other similar form of loss, damage or compensation.

15.5.2 Claims Related to Project Delay, Acceleration, Hindrances, Loss or Productivity or Similar Damages

As stated above in Subparagraphs §3.3.4, §6.1.3 and §8.3.3, Contractor shall not pursue any claim for money damages against Owner, Architect, Owner's Representative (or their respective directors, employees or agents) in the event of any project delay, acceleration, hindrances, loss of productivity or similar damages

ADD new Paragraph 15.6 as follows:

15.6 – Jurisdiction and Venue for Claims and Disputes

15.6 This Agreement shall be construed and interpreted under and in accordance with the laws of the Commonwealth of Virginia. Any action or proceeding between the parties hereto arising out of this Agreement shall be brought in the State Courts of the Commonwealth of Virginia, specifically the General District Court of Fluvanna County, pursuant to the Rules of Civil Procedure, and the parties hereby consent to such jurisdiction and venue.

END OF SECTION 000750

SECTION 012500 - SUBSTITUTIONS

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 SUMMARY

A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.

1.3 DEFINITIONS

A. The Definitions in this Article do not change or modify the meaning of other terms used throughout the Contract Documents.

B. Substitution: Products considered to be able to perform the same function but that do not necessarily have the same design, arrangement, details, utility requirements and/or dimensions, etc.

C. Approved Equal: Products of equivalent design, arrangement, details, utility requirements and/or dimensions, etc., produced by a manufacturer not specifically listed in the “Manufacturers” Article of a Specification Section.

1. Unless otherwise noted, Approved Equal products may be included in the Bid without additional approval by the Architect.

D. The following are not considered to be requests for substitution:

1. Revisions to the Contract Documents requested by the Owner or the Architect
2. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities having jurisdiction

1.4 SUBSTITUTIONS

A. Substitution Request: The Architect will consider requests for substitutions if received within 60 days AFTER the Notice to Proceed. Requests received more than 60 days after the Notice to Proceed may be considered or rejected at the sole discretion of the Architect. The Architect

will only consider requests for substitution submitted by the Contractor. No substitution requests will be considered from manufacturer's representatives or product vendors unless submitted through the Contractor. **No substitution requests will be considered during the bid period. Bids shall be based on products from one of the manufacturers specified or an "approved equal" product.**

1. Transmit three (3) copies of each request for substitution for consideration. Requests shall be on the Substitution Request Form found at the end of this Section. Requests not meeting this procedural requirement will be returned with **no action taken.**
2. Identify the product to be substituted in each request. Include the related Specification Section and Drawing number. Only one substitution request will be considered per Substitution Request Form.
3. Respond to and attach all of the following items to the Substitution Request Form:

    a. Coordination information, including a list of changes or modifications needed to other parts of the Work to accommodate the proposed substitution.
    b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability and aesthetic effect
    c. Product data, including drawings and descriptions of products
    d. Samples, where applicable or requested
    e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on the overall Contract Time.
    f. Cost information, including a proposal of the net change, if any in the Contract Sum. Substitutions requests submitted more than 60 days after Notice to Proceed must be accompanied by a credit proposal.
    g. The Contractor's certification that the proposed substitution conforms to all requirements of the Contract Documents in every respect and is appropriate for the application indicated.
    h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
    i. The Contractor's Certification that all costs of other Prime Contractors which are covered by the substitution will be borne by the substituting Contractor.

4. Architect's Action: The Architect will notify the Contractor of acceptance or rejection of the substitution within two (2) weeks of receipt of the substitution request. If necessary, the Architect will request additional information or documentation for evaluation within one (1) week of receipt of a request.

    a. Use the product specified if the Architect cannot make a decision on the use of a proposed substitute within the time allocated. Following acceptance of the substitution, the Contractor shall submit related information and product data in accordance with Division 1 Section "Submittals".
    b. No claim for additional cost or time will be considered as a result of time for considering substitutions by the Contractor.

B. Conditions for Consideration: The Architect will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as solely determined

by the Architect. Requests will be returned with **no action taken** if none of the following conditions are satisfied.

1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of the Contract Documents.
3. The specified product cannot be provided within the Contract Time. The Architect will not consider a substitution request if the specified product cannot be provided as a result of the Contractor's failure to pursue the Work promptly.
4. The requested substitution offers the Owner a substantial advantage, in cost, time, or energy conservation.
5. The specified product cannot receive necessary approval by a governing authority.
6. The specified product cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
7. The specified product cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
8. The specified product cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

C. Conditions for Acceptance: Following evaluation by the Architect and in accordance with a Change Order, the Contractor may make a substitution only with the consent of the Owner.

END OF SECTION 012500

SUBSTITUTION REQUEST FORM
(Attach to all requests for substitution)

PROJECT NAME AND NUMBER

_____

ARCHITECT 

Crabtree, Rohrbaugh & Associates - Architects
250 West Main Street, Suite 200
Charlottesville, VA 22902
Maryland • Pennsylvania • Virginia • West Virginia

SECTION	PARAGRAPH	SPECIFIED ITEM
_____	_____	_____

PROPOSED SUBSTITUTION

_____

The attached includes product data, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request. Applicable portions of the data are clearly identified.

The attached data also includes a description of changes to the Contract Documents which the requested substitution will require for its proper installation.

The Contractor certifies that the following paragraphs, unless modified on attachments, are correct:

1. The requested substitution does not affect the dimensions shown on the Drawings.
2. The requested substitution does not change the building design, including engineering design or detailing.
3. The requested substitution has no adverse effect (including additional scope of work or cost increase) on any other subtrades of the Work, on the Contractor's Construction Schedule or any specified warranty requirements.
4. Maintenance and service parts will be locally available for the requested substitution.
5. The requested substitution offers the Owner a substantial advantage, in cost, time, or energy conservation.

The Contractor further certifies that the function, appearance, quality and warranty of the requested substitution are equivalent or superior to those of the specified item.

CONTRACTOR'S CERTIFICATION:

Signature: _____ Date:_____

Firm: _____

Address: _____

Proposed Credit: $_____

Attachments:

SECTION 012600 - MODIFICATION PROCEDURES

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 SUMMARY

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

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.
2. Division 1 Section "Submittals" for requirements for the Contractor's Construction Schedule.
3. Division 1 Section "Substitutions" for administrative procedures for handling requests for substitutions.

1.3 MINOR CHANGES IN THE WORK

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

1.4 CHANGE ORDER PROPOSAL REQUESTS

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

1 Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
2 Within 14 calendar days of receipt of a proposal request, submit a detailed estimate of costs necessary to execute the change to the Architect for the Owner's review.

a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
b. Include the costs of labor and supervision DIRECTLY attributable to the requested change. The Contractor’s proposal MUST include hours and applicable rates.

c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
d. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.

1) Perform a Time Impact Analysis to demonstrate that the adjustment to Contract Time is the net due to Contractor, and takes into account any contribution Contractor, or other Contractors, may have had.

a) Additional Contract Time will be approved only if either the critical path is extended and the date of Substantial Completion is delayed, or a new critical path replaces the previous critical path and the date of Substantial Completion is delayed.
b) Use available float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposal Requests: When latent or unforseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a detailed request for a change to the Architect.

1 Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
2 Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
3 Include the costs of labor and supervision DIRECTLY attributable to the requested change. The Contractor's proposal MUST include hours and applicable rates.
4 Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
5 Comply with requirements in Division 1 Section "Substitutions" if the proposed change requires substitution of one product or system for a product or system specified.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Architect may issue a Construction Change Directive. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1 The Construction Change Directive contains a complete description of the change in the Work. It also designates the method to be followed to determine a change in the Contract Sum or 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 the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.6 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Proposal Request, the Architect will issue a Change Order for signatures of the Owner and the Contractor.

END OF SECTION 012600

SECTION 012800 - FIELD ENGINEERING

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 SUMMARY

A. General: This Section specifies administrative and procedural requirements for field-engineering services including, but not limited to, the following:

1. Professional surveying services

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Project Coordination" for procedures for coordinating field engineering with other construction activities.

1.3 QUALITY ASSURANCE

A. Surveyor Qualifications: Engage a land surveyor registered in Virginia to perform required land-surveying services.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify layout information shown on the Drawings in relation to the property survey and existing benchmarks before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.
2. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.

B. Establish and maintain a minimum of two (2) permanent benchmarks on the site, referenced to data established by survey control points.

1. Record benchmark locations with horizontal and vertical data on Project Record Documents.

C. Existing Utilities and Equipment: 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, including private utilities, and other construction. If the location of known or suspected underground utilities cannot be verified, notify the Owner and Architect.

1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping.

3.2 PERFORMANCE

A. Work from lines and levels established by the property survey. Establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale drawings to determine dimensions.

1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
2. As construction proceeds, check every major element for line, level, and plumb.

B. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log available for reference.

1. Record deviations from required lines and levels, and advise the Architect when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
2. Upon completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles and elevations of construction and sitework.

C. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels, and control lines and levels required for mechanical and electrical work.

E. Existing Utilities: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction. END OF SECTION 012800

SECTION 013100 – PROJECT COORDINATION

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 SUMMARY

A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations on the Project.

B. The Contractor shall be responsible for coordination.

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Field Engineering" specifies procedures for field-engineering services, including establishment of benchmarks and control pointsDivision 1 Section "Project Meetings" for progress meetings, coordination meetings, and preinstallation conferences.
3. Division 1 Section "Submittals" for preparing and submitting the Contractor's Construction Schedule.
4. Division 1 Section "Contract Closeout" for coordinating contract closeout procedures.
5. Division 4 Section “Unit Masonry Assemblies” for Masonry Preinstallation Shop Drawing requirements.
6. Division 21 through 28 Sections for specific coordination drawing requirements for mechanical and electrical installations.

1.3 GENERAL PROJECT COORDINATION PROCEDURES

A. The Contractor shall coordinate its construction activities with those of subcontractors and installers and other entities involved to assure efficient and orderly installation of each part of the Work. The Contractor shall coordinate its operations with operations included under different sections of the Specifications that depend on each other for proper installation, connection, and operation.

1. The Contractor shall schedule its construction operations in the 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. Where availability of space is limited, the Contractor shall coordinate installation of different components with subcontractors and installers to assure maximum accessibility for required maintenance, service, and repair.

3. The Contractor shall make adequate provisions to accommodate items scheduled for later installation.

B. The Contractor shall advise the Owner and Architect of overall coordination progress. When necessary, such as in congested spaces, the Contractor shall meet with the Owner and Architect and subcontractors and installers involved to resolve critical coordination issues.

1.4 CONSERVATION

A. The Contractor shall coordinate construction activities to assure that operations are carried out with consideration given to conservation of energy, water and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into the Work.

1.5 COORDINATION DRAWINGS

A. Prepare coordination drawings where careful coordination is needed for installation of products and materials. Prepare coordination drawings where limited space availability necessitates efficient installation of different components.

B. Coordination drawings shall be completed **within 60 calendar days of the date of Notice to Proceed**. The Contractor shall include preparation of coordination drawings in their Contract Price and shall indicate the value of this effort as a line item on their Schedule of Values.

1. Refer to Division 21 through 28 Sections for specific coordination drawing requirements for mechanical and electrical installations.
2. The HVAC scope of work shall be used to initiate the coordination drawings. The Contractor shall produce ¼" scale drawings, by building section, in electronic format. Electronic media, in the format and to the terms specified in Paragraph 3.12 of Section 000750 Supplementary General Conditions, is available from the Architect. This media will include walls, partitions, structural elements, finished floor elevations, ductwork, piping, and equipment locations and layout. The coordination drawings shall include all other trades for inclusion, layout and interface of all relative equipment, material and penetrations associated with the Work
3. Upon resolution of all interference issues, the Contractor shall issue a set of final coordination drawings to all entities involved in the Work and to the Owner and Architect.

1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to its full-time on site Project Superintendent, the Contractor shall provide other administrative and supervisory personnel as required for proper performance of the Work. Include special personnel required for coordination.

B. Project Coordinator: The Contractor shall provide a Project Coordinator, experienced in administration and supervision of building construction, including mechanical and electrical work.

1. Construction activities requiring coordination by the Project Coordinator include, but are not limited to, the following:

a. Scheduling and sequencing of the Work
b. Cutting and patching
c. Selections for compatibility
d. Coordination drawings
e. Inspections and tests
f. Temporary services and facilities
g. Daily project clean up activities

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: The Contractor shall require the installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 CLEANING AND PROTECTION

A. Clean and protect construction in progress and adjoining materials in place during handling and installation. Apply protective covering where required to assure protection from damage or deterioration until Substantial Completion.

B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

C. Limiting Exposures: The Contractor shall supervise its 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. Where applicable, such exposures include, but are not limited to, the following:

1. Thermal shock
2. Excessively high or low humidity
3. Air contamination or pollution
4. Water or ice
5. Solvents

6. Chemicals
7. Light
8. Radiation
9. Puncture
10. Abrasion
11. Heavy traffic
12. Soiling, staining, and corrosion
13. Bacteria
14. Rodent and insect infestation
15. Combustion
16. Electrical current
17. High-speed operation
18. Improper lubrication
19. Unusual wear or other misuse
20. Contact between incompatible materials
21. Destructive testing
22. Misalignment
23. Excessive weathering
24. Unprotected storage
25. Improper shipping or handling
26. Theft
27. Vandalism

Any Work subjected to such exposures shall be tested, corrected and/or replaced at the expense of the Contractor, in accordance with Division 0 Section “General Conditions of the Contract for Construction”.

D. The Contractor shall provide daily project clean up of the work site.

END OF SECTION 013100

SECTION 013150 - PROJECT MEETINGS

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 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:

1. Preconstruction conferences
2. Preinstallation conferences
3. Progress meetings
4. Coordination meetings

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Project Coordination" for procedures for coordinating project meetings with other construction activities.
2. Division 1 Section "Submittals" for submitting the Contractor's Construction Schedule.

1.3 PRECONSTRUCTION CONFERENCE

A. Within 15 calendar days of the date of Notice to Proceed, the Architect shall schedule and conduct a Preconstruction Conference at a time convenient to the Owner. Hold The Preconstruction Conference will be held at the Project Site or another convenient location. The purpose of this meeting will be to review the responsibilities and other requirements of the Contractor.

B. Attendees: Authorized representatives of the Owner, Architect and their consultants, the Contractor and its Superintendent, major subcontractors, manufacturers and suppliers. All participants at the Preconstruction Conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance including the following:

1. Construction schedule
2. Critical work sequencing
3. Designation of responsible personnel
4. Procedures for processing field decisions and Change Orders
5. Procedures for processing Applications for Payment

6. Distribution of Contract Documents
7. Submittal of Shop Drawings, Product Data, and Samples
8. Preparation of record documents
9. Use of the premises
10. Parking availability
11. Office, work, and storage areas
12. Equipment deliveries and priorities
13. Safety procedures
14. First aid
15. Security
16. Daily clean up activities
17. Working hours

1.4 PREINSTALLATION CONFERENCES

A. The Contractor shall conduct a preinstallation conference at the Project Site before each construction activity that requires coordination with other construction and as required by specific specification Sections.

B. Attendees: The 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 the Architect of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference, including requirements for the following:

a. Contract Documents
b. Options
c. Related Change Orders
d. Purchases
e. Deliveries
f. Shop Drawings, Product Data, and quality-control samples
g. Review of mockups
h. Possible conflicts
i. Compatibility problems
j. Time schedules
k. Weather limitations
l. Manufacturer's recommendations
m. Warranty requirements
n. Compatibility of materials
o. Acceptability of substrates
p. Temporary facilities
q. Space and access limitations
r. Governing regulations
s. Safety

t. Inspecting and testing requirements
u. Required performance results
v. Recording requirements
w. Protection

2. Record significant discussions and agreements and disagreements of each conference, and the approved schedule. Promptly distribute a record of the meeting to everyone concerned, including the Owner and the Architect.
3. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

1.5 PROGRESS MEETINGS

A. The Architect shall conduct progress meetings at the Project Site at bi-weekly intervals, unless otherwise needed.

B. Attendees: In addition to representatives of the Owner and the Architect, **it is mandatory that the Contractor be represented at all Progress Meetings. Key subcontractors relevant to the ongoing Work shall also attend Progress Meetings.** All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

1. Contractor's Construction Schedule: Review construction progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
2. Review the present and future needs of each entity present, including the following:

a. Interface requirements
b. Time
c. Sequences
d. Status of submittals
e. Deliveries
f. Off-site fabrication problems
g. Access
h. Site utilization
i. Temporary facilities and services
j. Hours of work
k. Hazards and risks
l. Daily clean up activities
m. Quality and work standards
n. Change Orders
o. Documentation of information for payment requests

D. Reporting: Minutes will be distributed by the Architect at least 3 calendar days prior to the next meeting to each party present and to parties who should have been present.

1. Schedule Updating: Refer to Division 1 Section “Construction Progress Documentation” for requirements. Issue the revised schedule concurrently with the report of each meeting.

1.6 COORDINATION MEETINGS

A. The Contractor shall conduct coordination meetings a minimum of once every two weeks. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special preinstallation meetings. Record meeting minutes and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting. In addition, the Owner and Architect shall recieve copies of these meeting minutes.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 013150

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

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 SUMMARY

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

1. Owner’s Preliminary Project Phasing Narrative
2. Contractor's Construction Schedule
3. Daily construction reports
4. Field condition reports
5. Special reports

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section “Project Coordination”
2. Division 1 Section "Applications for Payment" for submitting the Schedule of Values
3. Division 1 Section "Project Meetings" for submitting and distributing meeting and conference minutes
4. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections
5. Division 1 Section "Project Record Documents" for submitting Project Record Documents at Project closeout
6. Division 1 Section “Submittals” for procedural requirements regarding the Submittal Schedule
7. Division 1 Section “Temporary Facilities & Controls” for the various stages of Construction relative to temporary heat which must be identified on the Contractor’s Construction Schedule.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish dates.

2. Predecessor activity is an activity that must be completed before a given activity can be started.

B. Critical Path Method (CPM): A method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of the Project.

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

D. Event: The starting or ending point of an activity.

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

1. Float is not for the exclusive use or benefit of either the Owner or the Contractor. Extensions of the time to interim milestone dates or the Contract Completion Date, under the Contract, will be granted only to the extent that equitable time adjustment to the activity or activities affected by the Contract Modification or delay, exceeds the total float of the affected or subsequent paths and extends any interim milestone date or the Contract Completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

F. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

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

H. Milestone: A key or critical point in time for reference or measurement.

I. Network Diagram: A graphic diagram of a network schedule showing activities and activity relationships.

1.4 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article and in-house scheduling personnel to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.

B. Preliminary Construction Schedule: Submit one (1) copy in an acceptable format as determined by the Architect.

C. Contractor’s Construction Schedule: Submit one (1) paper Gantt Chart and one (1) electronic copy in its native format.

D. CPM Reports: The Contractor's Construction Schedule shall be a CPM Schedule. Concurrent with the CPM Schedule, submit three (3) printed copies of each of the following computer-generated reports. The format for each activity in the reports shall contain an activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date and total float.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.

E. Daily Construction Reports: Submit two (2) copies at weekly intervals.

F. Field Condition Reports: Submit two (2) copies at time of discovery of differing conditions.

G. Special Reports: Submit two (2) copies at time of unusual event.

1.5 QUALITY ASSURANCE

A. Scheduling Professional Qualifications: The Contractor’s Construction Schedule shall be composed and maintained by an individual having been employed for at least five years primarily as a CPM scheduler or an individual certified as a Planning and Scheduling Professional (PSP) by the Association for the Advancement of Cost Engineering (AACE). Documentation supporting compliance with these requirements shall be supplied to the Architect for review and acceptance.

B. Prescheduling Conference: Conduct conference at the Project site to comply with requirements in Division 1 Section "Project Meetings". Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Discuss constraints, including phasing, work stages, area separations and interim milestones.
2. Review delivery dates for Owner-furnished products.
3. Review time required for review of submittals and resubmittals.
4. Review requirements for tests and inspections by independent testing and inspecting agencies.
5. Review time required for completion and startup procedures.
6. Review and finalize the list of construction activities to be included in the schedule.
7. Review submittal requirements and procedures.
8. Review procedures for updating schedules.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities.

B. Coordinate the Contractor's Construction Schedule with the Schedule of Values, List of Subcontracts, Submittal Schedule, Progress Reports, Applications for Payment 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.

1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. The Work under the Contract Documents shall be planned, scheduled, executed, reported and accomplished using the Critical Path Method, in work days (excluding legal holidays). The provisions of the General Requirements are to be followed in scheduling construction activities.

B. The primary objectives of the requirements of this Section are: (1) to insure adequate planning and execution of the Work by the Contractor by having a schedule of construction activities for the Contractor and Subcontractors in initial form covering the first 120 days of construction within thirty (30) days of the Notice to Proceed and in final form within seventy-five (75) days of the Notice to Proceed; (2) to assist the Contractor in evaluating progress of the Work; (3) to provide for optimum coordination by the Contractor of their trades and Subcontractors; and (4) to permit the timely prediction or detection of events or occurrences which may affect the timely prosecution of the Work.

C. The Contractor is responsible for determining the sequence and logic of activities, the time estimates of the detailed construction activities and the means, methods, techniques and procedures to be employed with regard to the Work. The Contractor's Construction Schedule shall represent the Contractor's best judgment of how they shall prosecute the Work in compliance with the requirements of the Contract Documents. The Contractor shall ensure that the Contractor's Construction Schedule is current and accurate and is properly and timely monitored, updated and revised as Project conditions and the Contract Documents may require.

D. The Contractor shall consult with their major subcontractors relating to the preparation of their construction plan and the Contractor's Construction Schedule. Major subcontractors shall receive copies of those portions of the Contractor's Construction Schedule which relate to their Work and shall be continually advised of any updates or revisions to the Contractor's Construction Schedule as the Work progresses. When the Contractor submits their Construction Schedule or makes any proposed updates or revisions to such Schedule, it shall be concluded by the Owner that the Contractor has consulted with and has the concurrence of their major subcontractors. The Contractor shall be solely responsible for ensuring that all subcontractors comply with the requirements of the Contractor's Construction Schedule for their portions of the Work.

E. The Contractor shall include data relating to activities, durations and sequences as part of the Contractor's draft of the Construction Schedule. This data shall reflect the Contractor's actual construction plan for the Project, and shall fully comply with all requirements of the Contract Documents.

F. It is understood and agreed that the Contractor's Construction Schedule is to represent the Contractor's best plan and estimate for the Work; however, the Contractor acknowledges that the Contractor's Construction Schedule may have to be revised from time-to-time as the Project proceeds. The Contractor further acknowledges and agrees that the Owner does not guarantee that: (1) The Contractor can start Work activities on the "early start" or "late start" dates or complete Work activities on the "early finish" or "late finish" dates shown in the schedule, or as same may be updated or revised; or (2) The Contractor can proceed at all times in the sequence established by the Contractor's Construction Schedule, or that the Contractor can rely upon the utilization of only the resources and manpower they initially plan for the performance of the Work. Any changes, modifications or adjustments made by the Contractor to the Contractor's Construction Schedule shall be in full compliance with all requirements of the Contract Documents.

G. The Contractor acknowledges and agrees that their Contractor's Construction Schedule must be flexible in order to accommodate and allow for proper coordination.

H. The review of the Contractor's Construction Schedule or any other schedule or plan of construction of the Contractor, does not constitute an agreement by the Owner of any start or finish date in the schedule or specific durations or sequences for activities of the Contractor; further, nothing herein shall be construed as modifying or changing, or excusing the performance of the Contractor of required portions of the Work by the Completion Dates as set forth in the Contract Documents.

I. The Completion Dates set forth in the Contract Documents represent only the major items of Work and may or may not include interface dates with the construction activities of others. Completion Dates are Contract requirements and are the essence of the Contract Documents and to the coordination of the Work by the Contractor. Completion Dates represent the latest allowable completion time for those portions of the Work to which each Completion Date relates. The Completion Dates are not intended to be a complete listing of all Work under the Contract Documents.

J. Unless otherwise specifically provided in the Contract Documents, and in particular the General Requirements, the Contractor acknowledges that the Owner and Architect have contemplated in their planning and in any preliminary schedule that may have been prepared and made available to the Bidders, and in their budgeting for professional services, that the Work shall be performed on a 5-day work week basis, utilizing a single 8-hour shift per day. The Owner shall have the sole discretion of approving or rejecting a variance in the work week, number of shifts, or shift length. Unless otherwise agreed to by the Owner, the Contractor shall bear the cost of, and pay the Owner, for additional staff and supervisory personnel and inspectors of any authority having jurisdiction of the Work, necessary to support any variance in the contemplated work week, number of shifts or shift length.

1.8 POST AWARD ACTIVITIES

A. Upon receipt by the Contractor of the Notice to Proceed, and until the Contractor's Construction Schedule is completed, the Contractor shall do the following.

1. Within thirty (30) days of the Notice to Proceed, complete an Preliminary Construction Schedule governing the first 120 days of construction.
2. Within seventy-five (75) days of the Notice to Proceed, complete a Final Construction Schedule governing the Work.

1.9 CONSTRUCTION SCHEDULE CONTENT

A. The Contractor's Construction Schedule shall consist of a detailed CPM Schedule of all Work activities of the Project. The Schedule shall include, but not be limited to, the following information: (1) Project name; (2) completed Work ready for use by the Owner, etc.; (3) activities relating to different areas of responsibility, such as subcontracted Work which is distinctly separate from that being done by the Contractor directly; (4) different categories of Work as distinguished by craft or crew requirements; (5) different categories of Work as distinguished by equipment requirements; (6) different categories of Work as distinguished by materials; (7) distinct and identifiable subdivisions of Work such as structural slabs, beams, columns; (8) location of Work within the Project that necessitates different times or crews to perform; (9) outage schedules for existing utility services that shall be interrupted during the performance of the Work; (10) acquisition and installation of equipment and materials supplied and/or installed by the Owner; (11) material to be stored on site; and (12) dates for completion of Work.

B. For all major equipment and materials to be fabricated or supplied for the Project, the Contractor's Construction Schedule shall show a sequence of activities including: (1) preparation of Shop Drawings, Samples and all required Submittals as set forth in these specifications; (2) a reasonable time for review of Shop Drawings, Samples, and Submittals or such time as specified in the Contract Documents; (3) shop fabrication, delivery, and storage; (4) erection or installation; and (5) testing of equipment and materials.

C. The Contractor's Construction Schedule shall clearly indicate the dates of the various stages of construction relative to temporary heat, as defined in Part 3 Paragraph "Temporary Heat" of Division 1 Section "Temporary Facilities & Controls".

D. The Gantt Chart shall include the early dates and total float for each activity. There shall be no negative float in the baseline schedule.

E. All activity durations shall be given in calendar days. No activity shall have a duration of more than twenty (20) days.

1.10 UPDATING OF CONSTRUCTION SCHEDULE/PROGRESS REPORTS

A. On a monthly basis the Contractor shall prepare the Contractor's report of actual progress. Said report shall set forth up-to-date and accurate progress data, shall be based upon the Contractor's best judgment and shall be prepared by the Contractor in consultation with all subcontractors.

B. The progress report of the Contractor shall show the activities, or portions of activities, completed during the reporting period, the actual start and finish dates for these activities,

remaining durations and/or estimated dates for completion of Work for activities currently in progress.

C. The Contractor shall submit a written report with the updated progress analysis which shall include, but not be limited to, a description of problem areas, current and anticipated delaying factors and their impact, explanations of corrective actions taken or planned, any newly planned activities or changes in sequence, and proposed logic for a recovery schedule, if required, as further described herein. The report shall also include: (1) a narrative describing actual Work accomplished during the reporting period; (2) a list of major construction equipment used on the Project during the reporting period and any construction equipment idle during the reporting period; (3) the total number of personnel by craft actually engaged in the Work during the reporting period, with such total stated separately as to office, supervisory, and field personnel; (4) a manpower and equipment forecast for the succeeding thirty (30) days, stating such total as to office, supervisory and field personnel; (5) a list of Contractor-supplied materials and equipment, indicating current availability and anticipated job site delivery dates; and (6) changes or additions to the Contractor's supervisory personnel, if any, since the preceding progress report.

D. The Contractor understands and agrees that the submission and approval of progress updates and the receipt of progress reports are an integral part and basic element of the Applications for Payment; and that the Contractor shall not be entitled to any progress payment under the Contract Documents until, in the sole discretion of the Owner, the Contractor has fully complied with the requirements of this Section.

E. The Contractor shall be solely responsible for expediting the delivery of all materials and equipment to be furnished by or to them so that the progress of construction shall be maintained according to the currently approved Contractor’s Construction Schedule for the Work. The Contractor shall notify the Owner in writing, and in a timely and reasonable manner, whenever the Contractor determines or anticipates that the delivery date of any material or equipment to be furnished by the Contractor shall be later than the delivery date indicated by the Contractor’s Construction Schedule, or required consistent with the completion requirements of the Contract Documents, subject to schedule updates as herein provided.

F. The Contractor shall ensure that off site activities do not control the critical path of the Contractor’s Construction Schedule and instead, that the critical path only relates to activities on the site.

1.11 RECOVERY SCHEDULE.

A. Should the updated Contractor’s Construction Schedule, at any time during the Contractor's performance, show, in the sole opinion of the Owner that the Contractor is fourteen (14) or more days behind schedule for any Completion Date, or should the Contractor be required to undertake actions as provided for in these specifications, the Contractor shall prepare a recovery schedule at no additional cost to the Owner (unless the Owner is solely responsible for the event or occurrence which has caused the schedule slippage) explaining and displaying how the Contractor intends to reschedule their Work in order to regain compliance with the Contractor’s Construction Schedule during the immediate subsequent pay period.

B. If the Contractor believes that all of the time can be recovered during the subsequent pay period, the Contractor shall be permitted to prepare a recovery schedule as set forth below. However, if the Contractor believes it shall take more than thirty (30) days to recover all of the lost time, they shall prepare a revision to the Contractor's Construction Schedule and comply with all of the requirements of a schedule revision as set forth in this Paragraph 1.12 and Paragraph 1.13.

1. The Contractor shall prepare a limited duration recovery schedule, incorporating the best available information from Subcontractors and others which shall permit a return to the Construction Schedule at the earliest possible time. The Contractor shall prepare a recovery schedule to the same level of detail as the Construction Schedule for a maximum duration of one month.
2. Within two (2) days after submission by the Contractor of a recovery schedule, the Contractor shall participate in a conference with the Owner, to review and evaluate the recovery schedule. Within two (2) days of the conference, the Contractor shall submit the revisions necessitated by the review for the Owner's review and approval. The Contractor shall use the approved recovery schedule as their plan for returning to the Contractor's Construction Schedule.
3. The Contractor shall confer continuously with the Owner to assess the effectiveness of the recovery schedule. As a result of this conference:

    a. If the Owner determines the Contractor is still behind schedule, the Owner shall direct the Contractor to prepare a schedule revision and comply with all of the requirements of a schedule revision as stated herein and the other requirements of the Contract Documents; provided, however, that nothing herein shall limit in any way the rights and remedies of the Owner as provided elsewhere in the Contract Documents; or
    b. If the Owner determines the Contractor has successfully complied with the provisions of the recovery schedule, the Owner shall direct the Contractor to return to the use of the approved Contractor's Construction Schedule.

1.12 SCHEDULE REVISIONS

A. Should the Contractor desire to or be otherwise required under the Contract Documents to make modifications or changes in their method of operation, their sequence of Work or the durations of the activities in the Contractor's Construction Schedule, they shall do so in accordance with the requirements of this Paragraph and the Contract Documents. Revisions to the approved Contractor's Construction Schedule must be presented to and reviewed by the Owner.

B. The Contractor shall submit requests for revisions to the Contractor's Construction Schedule to the Owner, together with written rationale for revisions and description of logic for rescheduling Work and maintaining the Completion Dates listed in the Contract Documents. Proposed revisions acceptable shall be incorporated into the next update of the Contractor's Construction Schedule. The Contractor shall pay the Owner for costs incurred by the Lead Contractor for the revisions.

C. In all instances where a revision to the Contractor's Construction Schedule will affect the construction activities of other Prime Contractors, prior to submission by the Contractor of their proposed schedule revisions, they shall meet with and gain written approval of each of the Prime Contractors to make the revisions which shall be evidenced by the signatures of said Prime Contractors on the proposed schedule revisions. If accepted, the revisions, shall be binding upon the Contractor and all Prime Contractors on the Project.

1.13 FLOAT TIME

A. Float or slack time associated with one chain of activities is defined as the amount of time between the earliest start date and latest start date or between the earliest finish date and latest finish date for such activities, as calculated as part of the Contractor's Construction Schedule. The Contractor agrees that there shall be no basis for any modification of the Completion Date or dates or an extension of the Contract Time, or a claim for additional compensation as a result of any Project problem, Change Order or delay which only results in the loss of available positive float on the Contractor's Construction Schedule.

1.14 SCHEDULE OF INSPECTIONS AND TESTS

A. Prepare a schedule of inspections, tests, and similar services required by the Contract Documents. Submit the schedule within 10 days of the date established for commencement of the Work.

B. The schedule shall be in tabular form and shall include, but not be limited to, the following:

1. Specification Section number
2. Description of the test
3. Identification of applicable standards
4. Identification of test methods
5. Number of tests required
6. Time schedule or time span for tests
7. Entity responsible for performing tests
8. Requirements for taking samples.
9. Unique characteristics of each service

C. Distribute the schedule to the Owner, Architect, and each party involved in performance of portions of the Work where inspections and tests are required.

1.15 REPORTS

A. Daily Construction Reports: Prepare Daily Construction Reports recording the following information concerning events at the Project site:

1. List of subcontractors at Project site
2. Approximate count of personnel at Project site
3. High and low temperatures and general weather conditions

4. Accidents
5. Meetings and significant decisions
6. Unusual events (refer to special reports)
7. Stoppages, delays, shortages, and losses
8. Meter readings and similar recordings
9. Emergency procedures
10. Orders and requests of authorities having jurisdiction
11. Change Orders received and implemented
12. Construction Change Directives received
13. Services connected and disconnected
14. Equipment or system tests and startups
15. Partial Completions and occupancies
16. Substantial Completions authorized

B. Field Correction Reports: When the need to take corrective action that requires a departure from the Contract Documents arises, prepare a detailed report. Include a statement describing the problem and recommended changes. Indicate reasons the Contract Documents cannot be followed. Submit a copy to the Architect immediately.

C. 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.

D. Material Location Reports: At weekly intervals, prepare a comprehensive list of materials delivered to and stored at the site. The list shall be cumulative, showing materials previously reported plus items recently delivered. Include with the list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from the site. Submit copies of the list to the Architect at weekly intervals.

1.16 SPECIAL REPORTS

A. General: Submit Special Reports directly to the Owner within one day of an occurrence. Distribute copies of reports to parties affected by the occurrence and to the Architect.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at the Project site, whether or not related directly to the Work, prepare and submit a Special Report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise the Owner in advance when these events are known or predictable.

PART 2 - PRODUCTS (Not Applicable)
PART 3 - EXECUTION (Not Applicable)

END OF SECTION 013200

SECTION 013300 - SUBMITTALS

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 SUMMARY

A. This Section includes administrative and procedural requirements for Submittals required for performance of the Work, including the following:

1. Shop Drawings
2. Product Data
3. Samples
4. Quality Assurance Submittals
5. Submittals Schedule

B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Permits
2. Applications for Payment, along with Initial Statement of Contract Value
3. Performance and Payment Bonds
4. Insurance certificates
5. List of subcontractors

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Applications for Payment" specifies requirements for submittal of the Schedule of Values.
2. Division 1 Section “Substitutions” specifies procedural requirements for handling requests for substitutions made after award of the Contract.
3. Division 1 Section “Project Coordination” specifies requirements governing preparation and submittal of required Coordination Drawings.
4. Division 1 Section “Project Meetings” specifies requirements for submittal and distribution of meeting and conference minutes.
5. Division 1 Section “Construction Progress Documentation” specifies requirements for Submittal Schedules.
6. Division 1 Section “Quality Requirements” specifies requirements for submittal of inspection and test reports.
7. Division 1 Section “Warranties” specifies requirements for Submittal of warranties at project closeout.

8. Division 1 Section “Project Record Documents” specifies requirements for submittal of Project Record Documents at project closeout.

1.3 DEFINITIONS

A. Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.

1. Preparation of Coordination Drawings is specified in Division 1 Section “Project Coordination” and may include components previously shown in detail on Submittals.

B. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.

C. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples.

D. For Specification sections listing manufacturer’s products that include the phrases “but are not limited to the following” or “approved equal”, the Contractor shall be responsible to provide certification that the submitted product complies with the specified product. Include this certification with the Submittal. Final approval of a product submitted as an “equal” shall be solely by the Architect.

1.4 SUBMITTAL PROCEDURES

A. **All Submittals shall be processed electronically through email.**This software serves as a collaborative web environment which expedites and organizes the review process. The Owner will pay the fees associated to aquire the use of a license for the project. **Each Submittal is to include a SINGLE item or element of construction only. A Submittal Cover Sheet, on the attached form shall be completed, signed and certified by the Contractor for EACH Submittal. The Architect will not accept Submittals including multiple items or elements of construction. Submittals not meeting this procedure requirement may be returned with No Action Taken. No extension of Contract Time will be authorized due to failure to comply with this procedure.**

B. Coordination: Coordinate preparation and processing of Submittals with performance of construction activities. Transmit each Submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each Submittal with fabrication, purchasing, testing, delivery, other Submittals and related activities that require sequential activity.
2. Coordinate transmittal of different types of Submittals for related elements of the Work so processing will not be delayed by the need to review Submittals concurrently for coordination.

a. The Architect reserves the right to withhold action on a Submittal requiring coordination with other Submittals until all related Submittals are received.
b. Be advised that all interior finishes will be reviewed together and finally determined after receipt of all shop drawings, product data and samples which pertain to the interior finish color selections and related equipment.

3. To avoid the need to delay installation as a result of the time required to process Submittals, allow sufficient time for Submittal review, including time for resubmittals.

a. Allow a minimum of fifteen (15) working days for review. Additional time may be required for further review and/or coordination with consultants and subsequent Submittals as determined by the Architect.
b. If a resubmittal is necessary, process the same as the original Submittal.
c. No extension of Contract Time will be authorized because of failure to transmit Submittals to the Architect sufficiently in advance of the Work to permit processing.

C. Submittal Preparation: The Architect will not accept Submittals received without the attached 'Submittal Cover Sheet'. The Contractor shall stamp the 'Submittal Cover Sheet' with an action stamp. The Contractor shall mark the stamp appropriately to indicate the action taken. **Submittals shall be pre-reviewed by the Contractor PRIOR to submittal to the Architect for review.** See Paragraph 1.6.C.1 of this Section for additional information.

1. Use the 'Submittal Cover Sheet' attached at the end of this Section for all Submittals.
2. Complete all information required on the 'Submittal Cover Sheet'. Failure to do so may result in return of the Submittal with No Action Taken. No extension of Contract Time will be authorized because of failure to comply with this procedure.

D. Contractor's Transmittal: The Architect will not accept Submittals received from sources other than the Contractor.

1.5 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit three copies of the Submittal Schedule to the Architect. 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 final release or approval

B. Submit the Submittal Schedule, arranged in chronological order by dates required by the Contractor's Construction Schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication and delivery when establishing dates.

1. Coordinate the Submittal Schedule with the List of Subcontractors, the Schedule of Values and Contractor's Construction Schedule.
2. Initial Submittal: Submit an Initial Submittal Schedule concurrently with the Initial Construction Schedule. Include Submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture, fabrication or delivery.
3. Final Submittal: Submit a Final Submittal Schedule concurrently with the Final Contractor's Construction Schedule. Include all remaining Submittals. All Submittals are required to be submitted by the Contractor within ninety (90) days of the date of Notice to Proceed.

C. Distribution: Following response to the initial Submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

D. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.6 SUBMITTALS

A. Shop Drawings:

1. Submit newly prepared information drawn accurately and to scale. Highlight, circle or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
2. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

    a. Dimensions
    b. Identification of products and materials included by sheet and detail number
    c. Notation of dimensions established by field measurement
    d. Submit Shop Drawings electronically through the construction administration software for the Architect's review.
    e. The Architect will return Submittals electronically and indicate action taken.
    f. Maintain a complete set of Shop Drawings on site during construction.
    g. Maintain a set of marked up Shop Drawings as part of the project record documents to be turned over to the Owner at Contract Closeout.
    h. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

B. Product data

1. Collect and assemble Product Data into a single Submittal for each element or system of construction. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves.
2. Mark each copy to show applicable choices and options. Where printed Product Data includes information on product options that are not required or are not being used, mark Product Data to indicate the applicable products and information. Include the following information:

    a. Manufacturer's printed recommendations
    b. Compliance with trade association standards
    c. Compliance with recognized testing agency standards
    d. Application of testing agency labels and seals
    e. Notation of dimensions verified by field measurement
    f. Notation of coordination requirements
    g. Submit Product Data electronically through the construction administration software for the Architect's review.
    h. The Architect will return Product Data electronically and indicate action taken.
    i. Maintain a complete set of Product Data on site during construction.
    j. Maintain a set of marked up Product Data as part of the project record documents to be turned over to Owner at Contract Closeout.
    k. Do not use Product Data without an appropriate final stamp indicating action taken.

C. Action Stamp: **The Contractor will thoroughly review and stamp Submittals** with their action stamp. The Contractor shall mark the stamp appropriately to indicate the action taken.

1. Contractor’s review notations and action stamp shall be applied with **GREEN** color ink

D. Distribution: Furnish final approved Submittals to installers, subcontractors, suppliers, manufacturers, fabricators, and all others required for performance of construction activities.

1.7 SAMPLES

A. Where required by individual specification sections, submit full-size, fully fabricated Samples cured and finished as specified and physically identical to the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, physical material samples, color range sets or swatches showing color, texture, and pattern.

1. Mount or display Samples in a manner to facilitate review of qualities indicated. Prepare Samples to match the Architect's sample or in accordance with the product specifications. Include the following:

    a. Specification Section number and reference
    b. Generic description of the Sample
    c. Sample source
    d. Product name or name of the manufacturer
    e. Compliance with recognized standards
    f. Availability and delivery time

2. Submit Samples for review of size, kind, color, pattern and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final Submittal and the actual component as delivered and installed.

    a. Where variation in color, pattern, texture or other characteristic is inherent in the material or product represented, submit at least 3 multiple units that show approximate limits of the variations.
    b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
    c. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

3. Submit a full set of choices where Samples are submitted for selection of color, pattern, texture or similar characteristics from a range of choices as specifed.
4. The Architect will review and return preliminary Submittals with the Architect's notation, indicating selection and other action.

1.8 QUALITY ASSURANCE SUBMITTALS

A. Submit Quality Control Submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports and other quality control submittals as required under other Sections of the Specifications.

B. Certifications: Where other Sections of the Specifications require certification that a product, material or installation complies with specified requirements, submit a certification from the manufacturer certifying compliance with the specified requirements. The Architect reserves the right to require this certification to be notorized.

    1. The Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

C. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 1 Section "Quality Requirements."

1.9 ARCHITECT'S ACTION

A. Except for submittals for the record or information, where action and return is required, the Architect will review each Submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect will stamp each Submittal with a uniform action stamp. The Architect's review notations and action stamp shall be applied with **RED** color ink. The Architect will mark the stamp to indicate the action taken, as follows:

1. NO EXCEPTION TAKEN: The Work covered by the Submittal may proceed without further submittal, provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
2. EXCEPTION(S) NOTED: The Work covered by the Submittal may proceed provided it complies with notations or corrections on the Submittal and requirements of the Contract Documents. Final payment depends on that compliance.
3. SUBMIT SPECIFIED: Do not proceed with Work covered by the Submittal, including purchasing, fabrication, delivery or other activity. Prepare a new Submittal indicating specified material; resubmit without delay.
4. REVISE & RESUBMIT: Do not proceed with Work covered by the Submittal, including purchasing, fabrication, delivery or other activity. Revise or prepare a new Submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.
5. REJECTED: Do not proceed with Work covered by the Submittal, including purchasing, fabrication, delivery or other activity. Do not resubmit a revised copy; prepare a new Submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.

C. Unsolicited Submittals: The Architect will take no action on unsolicited submittals.

END OF SECTION 013300

SUBMITTAL COVER SHEET

(Attach to each copy of each submittal)

PROJECT NAME & NUMBER _____

ARCHITECT:

Crabtree, Rohrbaugh & Associates - Architects
250 West Main Street, Suite 200
Charlottesville, VA 22902
Maryland • Pennsylvania • Virginia • West Virginia

_____

ENGINEER: _____

CONTRACTOR: _____

SUBCONTRACTOR/SUPPLIER: _____

MANUFACTURER: _____

ITEM SUBMITTED: _____ SUBMITTAL NO. _____

SPECIFICATION SECTION NO. _____ PARAGRAPH NO. _____

DRAWING REFERENCE _____ DETAIL NO. _____

CERTIFICATION: (Circle One)

A. Certified to comply with Drawings and Specifications.

B. Certified to comply with Drawings and Specifications except as noted on Contractor attachment(s)

_____

Signature: Subcontractor/Supplier Date Signature: Contractor Date

Contractor's Action Stamp Here

Architect's Action Stamp Here

SUBMITTAL DEVIATION SHEET

(Attach this sheet behind Submittal Cover Sheet)

PROJECT NAME AND NUMBER: _____

ARCHITECT: 

Crabtree, Rohrbaugh & Associates - Architects
250 West Main Street, Suite 200
Charlottesville, VA 22902
Maryland • Pennsylvania • Virginia • West Virginia

_____

ENGINEER: _____

CONTRACTOR: _____

SUBCONTRACTOR/SUPPLIER: _____

PRODUCT SPECIFIED: _____

SPECIFICATION SECTION NO. _____ PARAGRAPH NO. _____

DRAWING REFERENCE _____ DETAIL NO. _____

DESCRIPTION OF DEVIATION: _____

_____

_____

_____

_____

_____

_____

_____

Signature: Subcontractor/Supplier Date Signature: Contractor Date

ARCHITECT/ENGINEER REMARKS:

SECTION 014000 - QUALITY REQUIREMENTS

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 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 the Contractor of responsibility for compliance with the requirements of the Contract Document.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit the Contractor's quality-control procedures that facilitate compliance with the requirements of the Contract Document.
3. Requirements for the Contractor to provide quality-control services required by the Architect, Owner or authorities having jurisdiction are not limited by the provisions of this Section.

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections
2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities
3. Divisions 2 through 33 Sections for specific test and inspection requirements

1.3 DEFINITIONS

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

requirements. Services do not include contract enforcement activities performed by the 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. Samples are not mockups.

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

1.4 DELEGATED DESIGN

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

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

1.5 REGULATORY REQUIREMENTS

A. Copies of Regulations: Obtain copies of applicable regulations and retain at the Project site to be available for reference by parties who have a reasonable need.

1.6 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 the Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with the performance and design criteria indicated. Include a list of codes, loads and other factors used in performing these services.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title
2. Description of test and inspection
3. Identification of applicable standards
4. Identification of test and inspection methods
5. Number of tests and inspections required

6. Time schedule or time span for tests and inspections
7. Entity responsible for performing tests and inspections
8. Requirements for obtaining samples
9. Unique characteristics of each quality-control service

D. 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 the time of sample taking and testing and inspecting
11. Comments or professional opinion on whether tested or inspected Work complies with the requirements of the Contract Documents
12. Name and signature of laboratory inspector
13. Recommendations on retesting and re-inspecting

E. Permits, Licenses, and Certificates: For the 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.

1.7 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 the manufacturer to inspect the installation of the 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 qualified and legally licensed to practice in the jurisdiction where the 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 the qualification requirements indicated and shall be engaged for the activities indicated.

1. The 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 the testing and inspecting indicated, as documented by ASTM E 548, and that specializes in the types of tests and inspections to be performed.

H. Preconstruction Testing: A qualified testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.

1. Contractor responsibilities include the following:

a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of the product to comply with performance requirements.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Fabricate and install test assemblies using installers who will perform the same tasks for this Project.
d. When testing is complete, remove assemblies; do not reuse materials on the Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to the Architect, with copy to the Contractor. Interpret tests and inspections and state in each report whether the tested and inspected work complies with or deviates from the requirements of the Contract Documents.

I. 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 the location and of the size indicated or, if not indicated, as directed by the Architect.
2. Notify the Architect at least seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain the Architect's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.8 QUALITY CONTROL

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

1. The Owner will furnish the Contractor with the names, addresses and telephone numbers of the testing agencies engaged and a description of the types of testing and inspecting each is engaged to perform.
2. The Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the requirements of the Contract Documents will be charged to the Contractor.

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

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

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

2. Notify testing agencies at least 24 hours in advance of the time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as the Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by the Contractor, which are not required by the Contract Documents, are the 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: The Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of the Owner.

1. Testing agency will notify the Architect and the 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 the Architect, with copy to the 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 requirements of the Contract Documents.
5. Testing agency will retest and reinspect corrected work. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the requirements of the Contract Documents will be charged to the Contractor.

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 the Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with the requirements established by the Contract Documents.

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

1. Notify the Architect and the 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 the Contractor.
4. Do not release, revoke, alter or increase the requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of the Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify the 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 the testing agency.
7. Security and protection for samples and for testing and inspecting equipment at the Project site.

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

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

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit the schedule within 30 days of the date established for the Notice to Proceed.

1. Distribution: Distribute the schedule to the Owner, the Architect, the testing agencies and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Applicable)

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 the 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.
2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

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

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

END OF SECTION 014000

SECTION 014100 – SAFETY

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 SUMMARY

A. General: This Section specifies the required safety procedures for this Project.

B. It is recognized that the safety of all personnel is the responsibility of the Contractor. It is the contractual obligation of the Contractor to adhere to all requirements of the Occupational Health and Safety Act (OSHA), as well as Local and State safety rules and regulations. The Contractor shall assure the safety of their personnel by providing all protection and safety devices, covers, etc. as they relate to the safe conduct of their work in accordance with all Local, State and Federal regulations

C. Responsibilities of the Contractor shall be as follows:

1. Inspect and maintain safe working conditions on the jobsite.
2. Maintain a competent person on site at all times designated to make safety inspections and to serve as the designated representative in charge of safety during an inspection by OSHA.
3. The Contractor's responsibilities and corresponding authority is as defined in the General Conditions of the Contract for Construction.
4. Provide regular and periodic safety inspections and reports by an independent safety consultant. Inspections and reports shall be performed at least once every three months.
5. Provide a safety representative who is trained in First Aid and CPR.
6. Separation of students and faculty from workers will be required to the greatest extent possible.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 ACCIDENTS

A. The Contractor shall notify the Owner of any personal injury at the project site that could require medical treatment. Also, any damage to property arising in connection with the Contractor's performance should be brought to the attention of the Owner as promptly as possible after the occurrence of such injury or damage, but no more than 24 hours after the

occurrence. Within 48 hours of such occurrence, the Contractor shall furnish to the Owner a complete written report of such injury or damage. Accident Reports shall include specific actions taken by the Contractor to preclude recurrence of similar incidents.

3.2 EMERGENCY DATA

A. The Contractor shall provide the Owner with the following emergency data prior to beginning work at the project site:

1. Emergency care facility to be utilized, including address and telephone number
2. Insurance company and local agent/name, address and telephone number
3. Detailed description of corporation or company safety program
4. Employees qualified in type of first aid; list employee and associated skills
5. Detailed description of specifically tailored job site safety program
6. Identify corporate and job site safety officer
7. Submit weekly TOOL BOX SAFETY TALK program/meeting minutes including:

    a. Day of week
    b. Time of day
    c. Location
    d. Attendance record
    e. Agenda
    f. Unsafe items previously discussed and date of correction
    g. Identify on-site personnel with First Aid training

8. All applicable MSDS Program sheets. (Include numbered pages and Table of Contents)
9. Submit completed hazardous substance survey form
10. Review project “Emergency Response Plan” with the Owner

3.3 SAFETY AGREEMENT

A. The Contractor shall review and comply with the following Safety Agreement before beginning work:

1. As the Contractor under this Contract, you have, by accepting this Contract, obligated yourself to conduct all your operations within this Safety Agreement.
2. The Contractor agrees that the prevention of accidents to employees engaged in the Work under this Agreement is the responsibility of the Contractor.
3. The Contractor agrees to comply with all laws, regulations and codes concerning safety as shall be applicable to the Work and to the safety standards established during the progress of the Work. When so ordered, the Contractor agrees to stop any part of the Work which any applicable agency may deem unsafe, until corrective measures satisfactory to the Owner and in accordance with the applicable Federal and/or State regulations have been taken and further agrees to make no claim for damages growing out of such stoppages. Should the Contractor neglect to adopt such corrective measures, the Owner may elect to hire an entity, perform the corrections and deduct the cost from

payments due or to become due the Contractor. Failure on the part of the Owner to stop unsafe practices shall in no way relieve the Contractor of their responsibility.

4. The Contractor realizes that an effective accident prevention program is to the mutual benefit the Contractor through improved employee and public relations and through increased efficiency and production.
5. Your attention is directed, but not limited to the following items:

3.4 HOUSEKEEPING

A. Indiscriminate accumulations of debris, waste or scrap in work areas will not be permitted. (Areas will be designated for storage or disposal). All materials, tools and equipment must be stored in an orderly manner in designated areas.

3.5 PERSONAL PROTECTION EQUIPMENT

A. Contractors must furnish their employees with the proper type of personal protective equipment as required by the operations being performed, including, but not necessarily limited to the following:

1. Hard Hats must be furnished to employees and worn at ALL times when on the project, whether or not an overhead hazard exists or what state of construction the project may be in.
2. The Owner requires that appropriate attire be worn at all times while employees are working on-site. Appropriate attire shall be as deemed necessary by the Owner and in accordance with all applicable OSHA regulations.

3.6 SAFETY MEETINGS

A. The Contractor is required to conduct, and all employees are required to attend Tool Box type safety meetings once a week. The meetings may be presided over by either the Contractor's foreman or another competent representative designated by the Contractor.

3.7 FIRE PROTECTION

A. The Contractor must supply approved fire extinguishers for emergency use within his own immediate area of operation, including the Contractor's office, tool and storage enclosures.

3.8 TREATMENT OF INJURIES

A. The Contractor shall require that all employees injured (no matter how slight) while working on the project, report immediately for First Aid treatment. The Contractor shall maintain adequate First Aid facilities in the field.

3.9 COOPERATION

A. Any deviation from this course of action will be called to the attention of the Contractor for immediate correction.

3.10 INSTALLED SAFETY APPARATUS

A. The Contractor is responsible for the installation of any safety apparatus required to perform the work of this project.

3.11 WEAPONS POLICY

A. All persons are prohibited from carrying, possessing or storing a handgun, firearm, or weapon of any kind while on the Project site, regardless of whether the person has registered the weapon or is licensed to carry a concealed weapon. Failure to abide by all terms and conditions of this policy may result in discipline up to and including termination. Further, carrying any weapon onto the Owner's property in violation of this policy will be considered an act of criminal trespass and possession of a weapon will be grounds for immediate removal of the person from the Project site, and may result in prosecution.

3.12 LISTENING DEVICES

A. The playing of radios or any other type of personal listening devices, using any type of speaker, including, but not limited to, headphones and ear buds, will not be permitted on this Project.

3.13 TOBACCO PRODUCTS

A. Smoking or the use of any tobacco products and vapor pens included on any school district-owned property is a violation of both District policy and state law. Violators caught smoking or using tobacco products will be removed from the Project and prosecuted to the fullest extent of the law.

3.14 DRUGS AND ALCOHOL

A. Any personnel caught possessing or using/consuming illegal drugs or alcoholic beverages on any part of school district-owned property will be removed from the Project and will be prosecuted to the fullest extent of the law.

END OF SECTION 014100

SECTION 017200 - PROJECT RECORD DOCUMENTS

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 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents.

B. Project Record Documents required include the following:

1. Copies of Record Drawings
2. Record Samples

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" specifies general requirements for preparing and submitting Project Record Documents
2. Division 1 Section “Operation and Maintenance Data” specifies requirements regarding submittal of operation and maintenance manuals.
3. Division 1 Section "Contract Closeout" specifies general closeout requirements.
4. Divisions 2 through 33 Sections for specific Project Record Document requirements.

D. Maintenance of Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and samples available at all times for the Architect's inspections.

1.3 RECORD DRAWINGS

A. Markup Procedures: During construction, maintain a set of black-line white prints of Contract Drawings and Shop Drawings for Project Record Document purposes. Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Architect's reference during normal working hours.

1. Mark these Drawings to show the actual installation where the installation varies from the installation shown originally. Give particular attention to information on concealed

elements that would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to, the following:

a. Dimensional changes to the Drawings
b. Revisions to details shown on the Drawings
c. Depths of foundations below the first floor
d. Locations and depths of underground utilities
e. Revisions to routing of piping and conduits
f. Revisions to electrical circuitry
g. Actual equipment locations
h. Duct size and routing
i. Locations of concealed internal utilities
j. Changes made by Change Order or Construction Change Directive
k. Changes made following the Architect's written orders
l. Details not on the original Contract Drawings

2. Mark record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
3. Mark record sets with red erasable colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
4. Mark important additional information that was either shown schematically or omitted from original Drawings.
5. Note Construction Change Directive numbers, alternate numbers, change-order numbers, and similar identification.

B. Responsibility for Markup: The Contractor shall prepare the record drawings.

1. Accurately record information in an understandable drawing technique.
2. Record data as soon as possible after obtaining it. Record and check the markup prior to enclosing concealed installations.
3. At the time of Substantial Completion, submit record drawings to the Architect for the Owner's records. Organize the drawings into sets and bind and label the sets for the Owner's continued use.

C. Copies and Distribution: Print 3 black-line prints of each drawing, whether or not changes and additional information were recorded. Organize the copies into manageable sets. Bind each set with durable-paper cover sheets. Include appropriate identification, including titles, dates, and other information on the cover sheets.

1. Organize and bind the original marked-up set of prints that were maintained during the construction period in the same manner.
2. Organize print sets. Place these sets in durable tube-type drawing containers with end caps. Mark the end cap of each container with suitable identification.
3. Submit the marked-up record set and three (3) copy sets to the Architect for the Owner's records; the Architect will retain one (1) copy set.

1.4 RECORD SAMPLE SUBMITTAL

A. Immediately prior to the date of Substantial Completion, meet with the Owner at the Project site to determine which of the samples maintained during the construction period shall be transmitted to the Owner for record purposes. Comply with the Architect's instructions for packaging, identification marking, and delivery to the Owner's sample storage space. Dispose of other Samples in a manner specified for disposing surplus and waste materials.

1.5 MISCELLANEOUS RECORD SUBMITTALS

A. Refer to Individual Specification Sections in Divisions 2 through 33 for additional record-keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Architect for the Owner's records.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 RECORDING

A. Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project.

END OF SECTION 017200

SECTION 017700 - CONTRACT CLOSEOUT

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 SUMMARY

A. This Section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:

1. Inspection procedures

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 33.

C. Related Sections: The following Sections contain requirements that relate to this Section.

1. Division 1 Section “Applications for Payment for information regarding the application which first follows Substantial Completion and for information regarding the Final Application for Payment
2. Division 1 Section “Final Cleaning” for additional information regarding project closeout, cleaning and punch list requirements.

D. In the event that Additional Services by the Architect are made necessary by the actions of the Contractor, such as failure to meet Substantial Completion or Final Acceptance of the Work within the time frames required by the Contract Documents, the Contractor’s responsibility for costs of the Architect as defined throughout this Section shall be calculated to the hourly rates noted in the Architect’s Agreement with the Owner. Costs shall be deducted from the Contractor’s final payment without Change Order.

1.3 CONTRACTOR’S PUNCH LIST AND TIME FOR COMPLETION

A. General: The Contractor’s Punch List is a comprehensive list of observed items requiring completion or correction, prepared by the Contractor for their Work.

B. Using the Punch List Form attached to the end of this Section, or in an electronic format acceptable to the Architect, (i.e. Bluebeam, PlanGrid, etc.), list the location, the date, a description of the item and the Contractor responsible for the item. Upon request by the Contractor, this Punch List Form can be provided in MS Excel format.

C. Except for items whose completion is delayed under circumstances as determined acceptable solely by the Architect, it is a requirement of the Project that ALL Punch List items, from both the Contractor's and the Architect's Punch Lists, be completed or corrected by the Contractor within 30 days of the date established by the Architect for Substantial Completion.

1. Except as noted above, if the Project is not finally accepted by the Architect within 30 days of the date established for Substantial Completion, or if additional and repeated site visits or meetings are required to assure Final Acceptance, all costs incurred by the Architect, both direct and indirect, shall be chargeable to the Contractor. Refer to Paragraph 1.2.D above.

1.4 SUBSTANTIAL COMPLETION

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

B. Preliminary Procedures: Before requesting inspection for a Certificate of Substantial Completion, complete all of the following tasks. List ALL exceptions in the request.

1. In the Application for Payment that first follows the date Substantial Completion is claimed, show 100% completion for the portions of the Work claimed as substantially complete.

    a. Include supporting documentation for completion as indicated in the Contract Documents and a statement showing an accounting of changes to the Contract Sum.
    b. If 100% completion cannot be shown, include a Punch List of incomplete items, the value of the incomplete construction and reasons the Work is not complete.

2. Advise the Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Submit record drawings, maintenance manuals, damage or settlement surveys, property surveys and similar final record information.
6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
9. Complete final cleanup requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred, exposed finishes.

C. Contractor Punch List Requirements: When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, and before the Architect will inspect the Work or issue a Certificate of Substantial Completion, the Contractor shall submit a Punch List for review of observed items requiring completion or correction prior to final payment. Failure to include an item does not alter the responsibility of the Contractor to complete all Work in accordance with the requirements of the Contract Documents.

1. If the Project is not defined as phased construction in the Contract Documents and the Contractor requests that a portion of the Project be inspected by the Architect to be deemed substantially complete, the Architect's costs, both direct and indirect, related to said inspection by the Architect shall be the responsibility of the Contractor. Refer to Paragraph 1.2.D above.

D. Inspection Procedures: Upon request by the Contractor for inspection and receipt of the Contractor's Punch List, the Architect will either proceed with the inspection to determine whether the Work or designated portion thereof is substantially complete or advise the Contractor of unfulfilled requirements. If the Architect's inspection discloses any item, whether or not included on the Contractor's Punch List, which is not sufficiently complete in accordance with the requirements of the Contract Documents to allow the Owner to occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion by the Architect, complete or correct such item upon notification by the Architect.

1. The Architect will prepare the Certificate of Substantial Completion following successful inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

2. If reinspection is necessary to assure Substantial Completion, all costs incurred by the Architect, both direct and indirect, shall be chargeable to the Contractor. Refer to Paragraph 1.2.D above. Following successful reinspection, the Architect will prepare a Certificate of Substantial Completion. If the Work is still not substantially complete, the Architect will advise the Contractor of its obligations that have not been fulfilled and which are still required for Substantial Completion.

    a. If necessary, the reinspection will be repeated. If this additional reinspection is required, all costs incurred by the Architect, both direct and indirect, shall be chargeable to the Contractor. Refer to Paragraph 1.2.D above.
    b. Results of the completed inspection will form the basis of requirements for Final Acceptance.

1.5 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection and final payment, complete all of the following tasks. List ALL exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a copy of the Contractor's Punch List of items to be completed or corrected, prepared at the time of Substantial Completion, endorsed, and dated by the Contractor. This copy of the Contractor's Punch List shall state that each item has been completed or otherwise resolved for acceptance.
4. Submit consent of surety to final payment.
5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Final Inspection Procedures: Upon receipt of the endorsed copy of the Contractor's Punch List and a request for final inspection, the Architect will either proceed with the inspection or advise the Contractor of unfulfilled requirements.

1. The Architect will either endorse and date the completed Contractor's Punch List following final inspection, or advise the Contractor of construction that must be completed or corrected before Final Acceptance.
2. If reinspection is necessary to assure Final Acceptance, all costs incurred by the Architect, both direct and indirect, shall be chargeable to the Contractor. Refer to Paragraph 1.2.D above. If the Work is still not finally complete, the Architect will advise the Contractor of its obligations that have not been fulfilled and which are still required for Final Acceptance.

    a. If necessary, the reinspection will be repeated. If this additional reinspection is required, all costs incurred by the Architect, both direct and indirect, shall be chargeable to the Contractor. Refer to Paragraph 1.2.D above.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for the Installer of each piece of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in the proper operation and maintenance of the installed equipment. Provide instruction by manufacturer's representatives if installers are not experienced in the operation and maintenance procedures. Include a detailed review of the following items:

1. Maintenance manuals
2. Record documents
3. Spare parts and materials
4. Tools

5. Lubricants
6. Fuels
7. Identification systems
8. Control sequences
9. Hazards
10. Cleaning
11. Warranties and bonds
12. Maintenance agreements and similar continuing commitments

B. As part of the instruction for operating equipment, demonstrate the following procedures:

1. Startup
2. Shutdown
3. Emergency operations
4. Noise and vibration adjustments
5. Safety procedures
6. Economy and efficiency adjustments
7. Effective energy utilization

3.2 CONTRACT REQUIREMENT AND CLOSEOUT CHECK LIST

A. Information: The attached Contract and Closeout Check List is a summary of the items required for Substantial Completion.

END OF SECTION 017700

SECTION 017800 - FINAL CLEANING

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 SUMMARY

A. This Section includes administrative and procedural requirements for final cleaning at Substantial Completion.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Temporary Facilities & Controls" specifies general cleanup and waste removal requirements.
2. Division 1 Section "Contract Closeout" specifies general contract closeout requirements.
3. Special cleaning requirements for specific construction elements are included in appropriate Sections of Divisions 2 through 33.

C. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.

1. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinners, in storm or sanitary drains.
2. Burning or burying of debris, rubbish or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final-cleaning services. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

B. Complete the following cleaning operations **before** requesting inspection for Substantial Completion for the Project or a portion of the Project.

1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and foreign substances.
2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
3. Remove petrochemical spills, stains, and other foreign deposits.
4. Remove tools, construction equipment, machinery, and surplus material from the site.
5. Remove snow and ice to provide safe access to the building.
6. 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.
7. Remove debris and surface dust from limited access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
8. Broom clean concrete floors in unoccupied spaces.
9. Vacuum clean carpet and similar soft surfaces removing debris and excess nap. Shampoo, if required.
10. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
11. Remove all non-permanent labels.
12. 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.

    a. Do not paint over "UL" and similar labels including mechanical and electrical nameplates.

13. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
14. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

15. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers and grills.
16. Clean ducts, blowers and coils if units were operated without filters during construction.
17. Clean food-service equipment to a sanitary condition, ready and acceptable for its intended use.
18. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.
19. Leave the Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects and other pests. Comply with regulations of local authorities.

D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

E. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.

1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 017800

SECTION 017823 - OPERATION AND MAINTENANCE DATA

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 SUMMARY

A. This Section includes administrative and procedural requirements for operation and maintenance manuals, including the following:

1. Preparing and submitting operation and maintenance manuals for building operating systems and equipment.
2. Preparing and submitting instruction manuals covering the care, preservation, and maintenance of architectural products and finishes.
3. Instruction of the Owner's operating personnel in the operation and maintenance of building systems and equipment.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" specifies preparation of Shop Drawings and Product Data.
2. Division 1 Section "Contract Closeout" specifies general closeout requirements.
3. Appropriate Sections of Divisions 2 through 33 specify special operation and maintenance data requirements for specific pieces of equipment or building operating systems.

1.3 QUALITY ASSURANCE

A. Maintenance Manual Preparation: In preparation of maintenance manuals, use personnel thoroughly trained and experienced in operation and maintenance of the equipment or system involved.

1. Where maintenance manuals require written instructions, use personnel skilled in technical writing where necessary for communication of essential data.
2. Where maintenance manuals require drawings or diagrams, use draftsmen capable of preparing drawings clearly in an understandable format.

B. Instructions for the Owner's Personnel: Use experienced instructors thoroughly trained and experienced in operation and maintenance of equipment or system involved to instruct the Owner's operation and maintenance personnel.

1.4 SUBMITTALS

A. Submittal Schedule: Comply with the following schedule for submitting operation and maintenance manuals:

1. **Before Substantial Completion**, when each installation that requires operation and maintenance manuals is nominally complete, submit two (2) draft copies of each manual to the Architect for review. Include a complete index or table of contents of each manual.

    a. The Architect will return one (1) copy of the draft with comments within 15 days of receipt.

2. Submit one (1) copy of data in final form **at least 15 days before final inspection**. The Architect will return this copy within 15 days after final inspection, with comments.
3. After final inspection, make corrections or modifications to comply with the Architect's comments. Submit the specified number of copies of each approved manual to the Architect **within 15 days of receipt of the Architect's comments**.

B. Form of Submittal: Prepare operation and maintenance manuals in the form of an instructional manual for use by the Owner's operating personnel. Organize into suitable sets of manageable size. Where possible, assemble instructions for similar equipment into a single binder.

1. Binders: For each manual, provide heavy-duty, commercial-quality, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to receive 8-1/2-by-11- inch paper. Provide a clear plastic sleeve on the spine to hold labels describing contents. Provide pockets in the covers to receive folded sheets.

    a. Where two (2) or more binders are necessary to accommodate data, correlate data in each binder into related groupings according to the Project Manual table of contents. Cross-reference other binders where necessary to provide essential information for proper operation or maintenance of the piece of equipment or system.
    b. Identify each binder on the front and the spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and the subject matter covered. Indicate volume number for multiple volume sets of manuals.

2. Dividers: Provide heavy paper dividers with celluloid-covered tabs for each separate Section. Mark each tab to indicate contents. Provide a typed description of the product and major parts of equipment included in the Section on each divider.
3. Protective Plastic Jackets: Provide protective, transparent, plastic jackets designed to enclose diagnostic software for computerized electronic equipment.
4. Text Material: Where maintenance manuals require written material, use the manufacturer's standard printed material. If manufacturer's standard printed material is not available, provide specially prepared data, neatly typewritten, on 8-1/2-by-11-inch white bond paper.
5. Drawings: Where maintenance manuals require drawings or diagrams, provide reinforced, punched binder tabs on drawings and bind in with text.

a. Where oversize drawings are necessary, fold drawings to the same size as text pages and use as a foldout.
b. If drawings are too large to be used practically as a foldout, place the drawings, neatly folded, in front or rear pocket of binder. Insert a typewritten page indicating drawing title, description of contents and drawing location at the appropriate location in the manual.

1.5 MANUAL CONTENT

A. In each manual, include information specified in the individual Specification Section and the following information for each major component of building equipment and its controls:

1. General system or equipment description
2. Design factors and assumptions
3. Copies of applicable Shop Drawings and Product Data
4. System or equipment identification, including:

    a. Name of manufacturer
    b. Model number
    c. Serial number of each component

5. Operating instructions
6. Emergency instructions
7. Wiring diagrams
8. Inspection and test procedures
9. Maintenance procedures and schedules
10. Precautions against improper use and maintenance
11. Copies of warranties
12. Repair instructions including spare parts listing
13. Sources of required maintenance materials and related services
14. Manual index

B. Organize each manual into separate Sections for each piece of related equipment. As a minimum, each manual shall contain a title page; a table of contents; copies of Product Data, supplemented by Drawings and written text and copies of each warranty, bond and service contract issued.

1. Title Page: Provide a title page in a transparent, plastic envelope as the first sheet of each manual. Provide the following information:

    a. Subject matter covered by the manual
    b. Name and address of the Project
    c. Date of submittal
    d. Name, address, and telephone number of the Contractor
    e. Name and address of the Architect
    f. Cross-reference to related systems in other operation and maintenance manuals

2. Table of Contents: After the title page, include a typewritten table of contents for each volume, arranged systematically according to the Project Manual format. Include a list of each product included, identified by product name or other appropriate identifying symbol and indexed to the content of the volume.

    a. Where a system requires more than one volume to accommodate data, provide a comprehensive table of contents for all volumes in each volume of the set.

3. General Information: Provide a General Information section immediately following the table of contents listing each product included in the manual, identified by product name. Under each product, list the name, address, and telephone number of the subcontractor or installer and the maintenance contractor. Clearly delineate the extent of responsibility of each of these entities. Include a local source for replacement parts and equipment.
4. Product Data: Where the manuals include manufacturer's standard printed data, include only sheets that are pertinent to the part or product installed. Mark each sheet to identify each part or product included in the installation. Where the Project includes more than one item in a tabular format, identify each item, using appropriate references from the Contract Documents. Identify data that is applicable to the installation, and delete references to information that is not applicable.
5. Written Text: Prepare written text to provide necessary information where manufacturer's standard printed data is not available, and the information is necessary for proper operation and maintenance of equipment or systems. Prepare written text where it is necessary to provide additional information or to supplement data included in the manual. Organize text in a consistent format under separate headings for different procedures. Where necessary, provide a logical sequence of instruction for each operation or maintenance procedure.
6. Drawings: Provide specially prepared drawings where necessary to supplement manufacturer's printed data to illustrate the relationship of component parts of equipment or systems or to provide control or flow diagrams. Coordinate these drawings with information contained in project record drawings to assure correct illustration of the completed installation.

    a. Do not use original project record documents as part of operation and maintenance manuals.

7. Warranties, Bonds, and Service Contracts: Provide a copy of each warranty, bond, or service contract in the appropriate manual for the information of the Owner's operating personnel. Provide written data outlining procedures to follow in the event of product failure. List circumstances and conditions that would affect validity of the warranty or bond.

1.6 MATERIAL AND FINISHES MAINTENANCE MANUAL

A. Submit three (3) copies of each manual, in final form, on materials and finishes to the Architect for distribution. Provide one section for architectural products, including applied materials and finishes. Provide a second section for products designed for moisture protection and products exposed to the weather.

1. Refer to individual Specification Sections for additional requirements on the care and maintenance of materials and finishes.

B. Architectural Products: Provide manufacturer's data and instructions on the care and maintenance of architectural products, including applied materials and finishes.

1. Manufacturer's Data: Provide complete information on architectural products, including the following, as applicable:

a. Manufacturer's catalog number
b. Size
c. Material composition
d. Color
e. Texture
f. Reordering information for specially manufactured products

2. Care and Maintenance Instructions: Provide information on the care and maintenance, including manufacturer's recommendations for types of cleaning agents to be used and methods of cleaning. Provide information on cleaning agents and methods that could prove detrimental to the product. Include the manufacturer's recommended schedule for cleaning and maintenance.

C. Moisture Protection and Products Exposed to Weather: Provide complete manufacturer's data with instructions on inspection, maintenance and repair of products exposed to the weather or designed for moisture-protection purposes.

1. Manufacturer's Data: Provide manufacturer's data giving detailed information, including the following, as applicable:

a. Applicable standards
b. Chemical composition
c. Installation details
d. Inspection procedures
e. Maintenance information
f. Repair procedures

D. Schedule: Provide complete information in the materials and finishes manual on products specified in the following Sections:

1. Face Brick and Masonry: Division 4 Section “Unit Masonry Assemblies”
2. Metal Wall Panels: Division 7 Section “Metal Wall Panels”
3. Finish Hardware: Division 8 Section “Door Hardware”
4. Carpet: Division 9 Section “Carpet”
5. Ceramic Tile: Division 9 Section “Tiling”
6. Wood Flooring: Division 9 Section “Wood Athletic Flooring”

1.7 EQUIPMENT AND SYSTEMS MAINTENANCE MANUAL

A. Submit six (6) copies of each manual, in final form, on equipment and systems to the Architect for distribution. Provide separate manuals for each unit of equipment, each operating system and each electric and electronic system.

1. Refer to individual Specification Sections for additional requirements on the operation and maintenance of the various pieces of equipment and operating systems.

B. Equipment and Systems: Provide the following information for each piece of equipment, each building operating system and each electric or electronic system.

1. Description: Provide a complete description of each unit and related component parts, including the following:

a. Equipment or system function
b. Operating characteristics
c. Limiting conditions
d. Performance curves
e. Engineering data and tests
f. Complete nomenclature and number of replacement parts

2. Manufacturer's Information: For each manufacturer of a component part or piece of equipment, provide the following:

a. Printed operation and maintenance instructions
b. Assembly drawings and diagrams required for maintenance
c. List of items recommended to be stocked as spare parts

3. Maintenance Procedures: Provide information detailing essential maintenance procedures, including the following:

a. Routine operations
b. Troubleshooting guide
c. Disassembly, repair, and reassembly
d. Alignment, adjusting, and checking

4. Operating Procedures: Provide information on equipment and system operating procedures, including the following:

a. Startup procedures
b. Equipment or system break-in
c. Routine and normal operating instructions
d. Regulation and control procedures
e. Instructions on stopping
f. Shutdown and emergency instructions

g. Summer and winter operating instructions
h. Required sequences for electric or electronic systems
i. Special operating instructions

5. Servicing Schedule: Provide a schedule of routine servicing and lubrication requirements, including a list of required lubricants for equipment with moving parts.
6. Controls: Provide a description of the sequence of operation and as-installed control diagrams by the control manufacturer for systems requiring controls.
7. Coordination Drawings: Provide each Contractor's Coordination Drawings.

    a. Provide as-installed, color-coded, piping diagrams, where required for identification.

8. Valve Tags: Provide charts of valve-tag numbers, with the location and function of each valve.
9. Circuit Directories: For electric and electronic systems, provide complete circuit directories of panelboards, including the following:

    a. Electric service
    b. Controls
    c. Communication

1.8 INSTRUCTIONS FOR THE OWNER'S PERSONNEL

A. **Prior to final inspection**, instruct the Owner's personnel in the operation, adjustment, and maintenance of products, equipment and systems. Provide instruction at mutually agreed upon times.

1. For equipment that requires seasonal operation, provide similar instruction during other seasons.
2. Use the operation and maintenance manuals for each piece of equipment or system as the basis of instruction. Review contents in detail to explain all aspects of operation and maintenance.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 017823

SECTION 017900 - WARRANTIES

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 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1. Refer to the General Conditions of the Contract for Construction for terms of the Contractor's period for correction of the Work.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" specifies procedures for submitting warranties.
2. Division 1 Section "Contract Closeout" specifies contract closeout procedures.
3. Divisions 2 through 33 Sections for specific requirements for warranties and special warranties on products and installations specified to be warranted.
4. Certifications and other commitments and agreements for continuing services to the Owner are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers and subcontractors required to countersign special warranties with the Contractor.

1.3 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with the requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with the requirements of the Contract Documents.

E. Where the Contract Documents require a special warranty or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.5 SUBMITTALS

A. Submit written warranties to the Architect **prior to the date certified for Substantial Completion.** If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion of the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within 15 days of completion of that designated portion of the Work.

B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.

C. Form of Submittal: At Final Completion compile two (2) copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

D. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the 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 the installer.
2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name and the name of the Contractor.
3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 017900

SECTION 012700 - CUTTING AND PATCHING

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 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Field verify existing conditions prior to proceeding with cutting and patching. Notify the Architect in writing of any conditions that are significantly different from those indicated on the Drawings.

C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section “Project Coordination” for procedures for coordinating cutting and patching with other construction activities, and for required coordination drawings.
2. Division 1 Section "Selective Demolition" for demolition of selected portions of the building.
3. Division 1 Section “Project Meetings” for meeting procedures for the required Cutting and Patching Conference.
4. Divisions 2 through 33 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
5. Division 7 Section "Firestop Systems" for patching fire-rated construction.

1.3 DEFINITIONS

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

B. Patching: Fitting and repair Work required to restore surfaces to original conditions after installation of other Work.

1.4 GENERAL

A. Build sleeves and anchors into the Work for the proper engagement of the Work.

B. Coordinate and provide chases, openings and recesses in new Work to avoid cutting and patching to the greatest extent possible.

C. Perform all cutting necessary to install Work. Cutting of structural members will not be permitted except by written permission of the Architect.

D. Repair at own expense, all surfaces cut into or damaged as a result of Work.

E. All cutting and patching that is unnecessary, excessive or carelessly done, and cutting of new construction made necessary by ill-timed Work shall be repaired at own expense. All such repairing shall be accomplished by skilled mechanics of the proper trade and to the satisfaction of the Architect.

1.5 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least seven (7) days prior to the required Cutting and Patching Conference described below, requesting approval to proceed. Include the following information:

1. Describe the extent of cutting and patching, show how it will be performed, and indicate why it cannot be avoided.
2. Describe anticipated results or changes to in-place construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3. List products to be used and firms or entities that will perform the Work.
4. Indicate dates when cutting and patching will be performed.
5. List utility services and mechanical and electrical systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
6. Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Means and methods of all cutting and patching Work shall be the sole responsibility of the Contractor.
8. Obtain approval of the cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory Work.

1.6 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:

1. Primary operational systems and equipment.
2. Air or smoke barriers

3. Mechanical systems, piping and ducts.
4. Fire protection systems
5. Control systems.
6. Communication systems.
7. Conveying systems
8. Electrical wiring systems.
9. Operating systems of special construction in Division 13 Sections.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include, but are not limited, to the following:

1. Water, moisture, or vapor barriers.
2. Membranes and flashings.
3. Exterior storefront construction.
4. Equipment supports.
5. Piping, ductwork, vessels, and equipment.
6. Noise and vibration control elements and systems.

D. Visual Requirements: Do not cut and patch construction exposed on the exterior, in occupied spaces, or in other exposed to view locations in a manner, in the Architect's sole opinion, that results in visual evidence of cutting and patching or that would otherwise reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. Cutting and Patching Conference: Meet at the Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review the previously submitted Cutting and Patching Proposal and areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding with Work.

1.7 WARRANTY

A. Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the greatest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that in the Architect's opinion, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Utility Services and Mechanical/Electrical Systems: Where services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled mechanics and workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete cutting and patching operations without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Cut or drill finished surfaces from the exposed or finished side into concealed surfaces.
3. Cut concrete and masonry using a cutting machine such as an abrasive saw or a diamond-core drill.
4. For excavating and backfilling, comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. For mechanical and electrical services, cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with seams that are invisible. Provide materials and comply with installation requirements specified in other Sections.

1. Test and inspect patched areas after completion to demonstrate integrity of installation.
2. Restore exposed finishes of patched areas and extend finish into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces. Provide a sound, even surface of uniform color and appearance.

    a. Where patching occurs in a smooth, painted surface, extend final paint coat over entire unbroken surface containing the patch.
    b. Clean and properly prepare surfaces, piping, conduit, and similar features before applying paint or other finishing materials.
    c. Restore damaged pipe covering to its original condition.

D. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty and similar materials.

END OF SECTION 012700

SECTION 015000 - TEMPORARY FACILITIES & CONTROLS

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 SUMMARY

A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection.

B. Temporary utilities include, but are not limited to, the following:

1. Temporary water service and distribution
2. Temporary electrical power service and light
3. Storm facilities and sanitary sewer

C. Support facilities include, but are not limited to, the following:

1. Field offices and storage sheds
2. Temporary roads and paving
3. Dewatering facilities
4. Temporary enclosures
5. Hoists
6. Temporary project identification signs and bulletin boards
7. Waste disposal services
8. Rodent and pest control
9. Construction aids and miscellaneous services and facilities
10. Temporary heat
11. Ventilation
12. Sanitary facilities, including drinking water

D. Security and protection facilities include, but are not limited to, the following:

1. Temporary Fire Protection
2. Barricades, warning signs, and lights
3. Sidewalk bridges
4. Enclosure fencing for the site
5. Environmental protection

1.3 RESPONSIBILITIES

A. The Contractor is responsible for the following:

1. Installation, operation, maintenance, and removal of each temporary facility, as well as the costs and use charges associated with each facility unless noted otherwise.
2. Temporary electric power service and distribution. Prior to temporary utility availability, provide trucked in service.
3. Temporary lighting.
4. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting.
5. Multi-phase power service or power requirements in excess of 120-V, single phase, temporary power. Electric service for welding.
6. Temporary enclosure of the building.
7. Temporary heat, ventilation, humidity control.
8. Temporary toilets, including disposable supplies.
9. Containerized bottled-water drinking-water units.
10. Temporary water service. Prior to temporary utility availability, provide trucked in service.
11. Dewatering, including ice and snow removal of the building pad and in areas of foundation excavation and for all general construction activities.
12. Temporary roads and paving required to complete construction activities.
13. All hoisting requirements for construction activities
14. Continuous removal and disposal of general construction waste and debris generated by construction activities.
15. Collection and proper disposal of hazardous, dangerous, unsanitary or other harmful waste material.
16. Secure enclosure and lockup.
17. Secure lockup of tools, materials and equipment.
18. Construction aids and miscellaneous services and facilities.
19. Job trailer or field office.
20. Storage and fabrication sheds or trailers.
21. Temporary safety facilities.
22. Temporary construction identification signs and temporary site directional signage.
23. Rodent and pest control.
24. Barricades, warning signs and lights for construction activities.
25. Enclosure fence as required by construction activities. Refer to site drawings for extent.
26. Environmental protection for construction activities.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect unless specifically noted otherwise. The Owner will not accept the Contractor's cost or use charges for temporary services or facilities as a basis of claim for an adjustment in the Contract Sum or the Contract Time.

B. Water Service: The Owner will pay water service use charges, for all metered water used by all

entities engaged in construction activities at the Project Site.

C. Electric Power Service: The Owner will pay electric power service use charges, for all metered electric power used by all entities engaged in construction activities at the Project Site. The Owner's electric service is not permitted to be used for temporary heat.

D. Fuel for Temporary Heat: As described in the Temporary Heat paragraph.

1.5 SUBMITTALS

A. Temporary Utilities: The Contractor shall submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Within 15 days of the date established for submittal of the Contractor's Construction Schedule, the Contractor shall submit a schedule indicating implementation and termination dates of each temporary utility for which the Contractor is responsible.

1.6 QUALITY ASSURANCE

A. Regulations: The Contractor shall comply with industry standards and with applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Building code requirements
2. Health and safety regulations
3. Utility company regulations
4. Police, fire department and rescue squad rules
5. Environmental protection regulations

B. Standards: The Contractor shall comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities".

1. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.7 PROJECT CONDITIONS

A. Temporary Utilities: The Contractor shall prepare a schedule indicating dates for implementation and termination of each temporary utility for which the Contractor is responsible. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary services to use of permanent services.

1. Temporary Use of Permanent Facilities: The Contractor shall assume responsibility for its operation, maintenance and protection during use as a construction facility prior to the Owner's acceptance, regardless of previously assigned responsibilities. The Contractor shall make permanent facilities available in accordance with the approved Contractor's Construction Schedule.
2. Warranty Period: The Warranty Period for the entire project shall begin on the date of Substantial Completion, regardless of the start-up date for use as a temporary or permanent facility, including but not limited to materials and equipment.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on-site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: The Contractor shall provide new materials. If acceptable to the Owner or Architect, undamaged, previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

B. Lumber and Plywood: Comply with the requirements of Division 6 Section "Rough Carpentry".

1. For job-built temporary offices, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
2. For signs and directory boards, provide exterior-type, Grade BB, high-density concrete form grade overlay plywood of sizes and thicknesses indicated.
3. For fences and vision barriers, provide minimum 3/8-inch thick exterior plywood.
4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch thick exterior plywood.

C. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

D. Water: Provide potable water approved by local health authorities.

E. Open-Mesh Fencing (Driven Posts): Provide 0.12-inch thick, galvanized 2-inch chain-link fabric fencing 6 feet high with galvanized steel pipe posts, 1-1/2 inches I.D. for line posts and 2-1/2 inches I.D. for corner posts.

F. Open-Mesh Fencing (Portable): Provide 0.12-inch thick, galvanized 2-inch chain-link fabric fencing 6 feet high on portable frames with self-standing T-foot posts

2.2 EQUIPMENT

A. General: The Contractor shall provide new equipment. If acceptable to the Owner or Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for the use intended.

B. Water Hoses: Provide 3/4-inch heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at point of hose discharge.

C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher voltage outlets. Provide 120-V, single phase, ground-fault outlets at 100' on center in corridor areas and spaces larger than 800 square feet. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

E. Lamps and Light Fixtures: Provide general service lamps of wattage required for adequate illumination. At a minimum, install weatherproof sockets complete with lamps at 20' on center in all corridor areas, circulation areas and all spaces over 400 square feet. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

G. Temporary Offices: The Contractor shall provide its own prefabricated or mobile units with lockable entrances, operable windows and serviceable finishes.

1. The Contractor, if their temporary office trailer is not sufficiently sized to accommodate the needs of regular job conferences, shall provide and maintain, in addition to their job trailer, a meeting trailer for such use, for the duration of the Project. The meeting trailer shall be complete with a heating and air-conditioning unit capable of maintaining a temperature range of between 70ºF and 75ºF year round.

2. The General Contractor shall provide all required electrical and plumbing. Use charges for all metered electrical and water will be paid by the Owner.
3. Provide daily housekeeping services, provide snow removal services and relocate the field office trailer to a secondary location should the original location serve to impede the progress and/or completion of the Project.

H. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar non-absorbent material.

I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent and size required by location and class of fire exposure.

J. First Aid Supplies: Comply with regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for the installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. The Contractor shall provide each facility ready for use when needed to avoid delay. Maintain and modify as required. 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: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with the utility company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

B. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.

C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity and power characteristics during construction period. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters and main distribution switch gear.

1. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 V, ac 20 ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.

D. Temporary Lighting: When an overhead floor or roof deck has been installed, provide temporary lighting with local switching.

1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system.

E. Temporary Heat: As described in the Temporary Heat paragraph below.

F. Heating Facilities: As described in the Temporary Heat paragraph below.

G. Sanitary Facilities: Sanitary facilities include temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

1. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.

H. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

1. Provide separate facilities for male and female personnel.

I. Environmental Protection: In addition to the provisions indicated on the drawings, provide earthen embankments and similar barriers in and around excavations and sub-grade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.3 TEMPORARY HEAT

A. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations, or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient conditions required and minimize consumption of energy.

1. Provide temporary heat at varying stages of the Project to allow construction operations to proceed in an orderly, sequential manner.

2. Temporary heat shall be initiated and maintained to allow the performance of Work for which a particular minimum ambient temperature must be maintained to meet the criteria described in individual sections of the technical specifications and as set forth by manufacturer’s recommendations.
3. Temporary heat shall be provided to ensure that construction activities conform with the Contractor’s Construction Schedule and to the scheduling sequence established by the Lead Contractor and as further directed by the Architect.
4. The term “building enclosure” refers to a level of completion of the building, or a designated portion thereof, that consists of the following:

a. Construction of roof structure, roof, insulation and roofing membrane
b. Construction of back-up masonry or exterior metal studs with exterior sheathing
c. Temporary enclosure of exterior wall openings. Refer to the “Temporary Enclosures” paragraph below for additional information.

B. Heating Facilities: Except where use of the permanent system is authorized, provide properly vented, self-contained LP gas or natural gas heaters with individual space thermostatic control.

1. Use of gasoline, oil or kerosene fueled space heaters is prohibited.

3.4 SUPPORT FACILITIES INSTALLATION

A. Storage and Fabrication Facilities: Install storage and fabrication sheds or mobile trailers, sized, furnished and equipped to accommodate materials and equipment involved. Facilities may be open shelters or fully enclosed.

B. Drinking Water Facilities: Provide containerized tap dispenser bottled water type drinking water units, including disposable paper supply.

C. Dewatering Facilities and Drains: Maintain the site, excavations and construction free of water, ice and snow.

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

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
2. Install tarpaulins securely, with non-combustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
3. Close openings through floor or roof decks and horizontal surfaces with load bearing wood framed construction.

E. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

F. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated; install where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.

1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.

G. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F. Handle hazardous, dangerous or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

H. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

I. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access. If not indicated on the drawings, verify temporary facility locations with the Owner prior to installation.

1. Maintain support facilities until near Substantial Completion.

J. Temporary Roads: Construct and maintain temporary roads to support the required loading adequately and to withstand exposure to traffic during the construction period. To the greatest extent possible, locate temporary roads, storage areas and parking where the same permanent facilities will be located.

1. Paving: Comply with Project specifications for construction and maintenance of temporary paving.
2. Coordinate temporary paving development with sub-grade grading, compaction, installation and stabilization of sub-base and installation of base and finish courses of permanent paving.
3. Install temporary paving to minimize the need to rework the installations and result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.
4. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. General: Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.

B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10, "Standard for Portable Fire Extinguishers," and NFPA 241, "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

2. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
3. Provide supervision of welding operations, combustion-type temporary heating units and similar sources of fire ignition.

C. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

D. Storage of Flammable and Combustible Materials and Liquids: Comply with NFPA 241, “Standard for Safeguarding Construction, Alterations, and Demolition Operations” and NFPA 30, “Flammable and Combustible Liquid Code”

1. Storage: Store flammable and combustible materials and liquids in weathertight, ventilated and secure facilities outside of the building. Provide temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire and losses.

E. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

F. Enclosure Fence: When excavation begins, install a lockable entrance gate and post "No Trespassing" signs at 50' on center around the site perimeter.

G. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.

1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

H. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid using tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons, homes or businesses near the site.

3.6 OPERATION, TERMINATION, AND REMOVAL

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

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

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.
2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Owner requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the 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 the property of the Contractor. The Owner reserves the right to take possession of project identification signs.
2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.
3. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:

    a. Replace air filters and clean inside of ductwork and housings.
    b. Replace significantly worn parts and parts subject to unusual operating conditions.
    c. Replace lamps burned out or noticeably dimmed by hours of use.

END OF SECTION 015000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, vapor barriers, mix designs, placement procedures, other accessory materials and finishes.

B. Cast-in Place concrete includes but is not limited to the following:

1. Footings and foundation walls
2. Interior slabs-on-grade
3. Suspended slabs
4. Masonry infill
5. Equipment bases and foundations

C. Related Sections include the following:

1. Division 5 “Structural Steel Framing” for embedded items.
2. Division 5 “Metal Fabrications” for embedded items.
3. Division 32 Section “Concrete Pavement” for exterior concrete pavement and sidewalks.
4. Division 32 Section “Concrete Paving Joint Sealants” for joint sealants to be used in exterior concrete paving.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1. If mix water is to be withheld at the plant and later added at the Project site to provide the water to cement ratio of the design mix, this must be clearly indicated on EVERY delivery ticket to the Project site.

C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement". Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement.

D. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Cementitious materials and aggregates.
2. Steel reinforcement and reinforcement accessories.
3. Polypropylene Fiber Reinforcement
4. Admixtures.
5. Curing materials.
6. Floor and slab treatments, when required by the Drawings.
7. Vapor barriers.
8. Semi-rigid joint filler.
9. Premolded expansion joint-filler strips.
10. Repair materials, when required for repair, and use of the repair is accepted by the Architect.
11. Epoxy for drilling and placing dowels into hardened concrete.
12. Waterstops

E. Minutes of Pre-installation Conference.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must use Pennsylvania Department of Transportation certified materials.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Refer to "Field Quality Control" Paragraph below for testing requirements.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

E. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel".

F. ACI Publications: Comply with the following, unless more stringent provisions are indicated:

1. ACI 301, "Specification for Structural Concrete".
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials".
3. CRSI Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
4. ACI 306.1 "Standard Specification for Cold Weather Concreting"
5. ACI 305 "Hot Weather Concreting"

G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings".

1. Before submitting design mixes, review concrete mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixes.
c. Ready-mix concrete producer.
d. Concrete subcontractor.

2. The Contractor's superintendent must conduct a Pre-installation meeting with a representative of the fiber manufacturer, listed in the "Polypropylene Fiber Reinforcement" Paragraph of this specification below, to obtain technical assistance, guidance, and recommendations for mix designs and finishing practices for a fiber free finished top surface prior to placing any building slab concrete. In addition to any recommendations given by the fiber manufacturer, the Contractor shall follow the requirements of the "Finishing Floors and Slabs" Paragraph of this specification below. Any conflict between the requirements noted and recommendations of the fiber manufacturer shall specifically be brought to the Architect.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage. Store reinforcement in a manner that prevents soil, mud, debris, or oil from adhering to the bars. If for any reason soil, mud, debris, oil or other deleterious material is on a bar, it shall be removed before the bar is installed.

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.

1. Plywood, metal, or other approved panel materials that produce a smooth, formed finish are acceptable.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved materials are acceptable. Provide lumber dressed on at least two edges and one side for a tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 inch by 3/4 inch, minimum.

D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of the exposed concrete surface.
2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

F. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.

B. Joint Dowel Bars: Plain-steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.

1. Fly Ash: Fly ash may be part of the concrete mix as follows.

a. Fly ash to be in accordance with ASTM C 618, Class C or F. Use only in concrete mixes for foundation footings, CMU wall grout fills and slabs-on-grade.

2. Ground Granulated Blast-Furnace Slag

a. Use one brand of cement throughout project unless approved otherwise by Architect.

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:

1. Nominal Maximum Aggregate Size: One inch (3/4 inch where placement by pumping)

C. Water: Potable and complying with ASTM C 94.

2.5 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.

B. Air-Entraining Admixture: ASTM C 260.

1. Admixture shall be certified by manufacturer to be compatible with other admixtures.

C. Water-Reducing Admixture: ASTM C 494, Type A.

1. Products: Subject to compliance with requirements, products include, but are not limited to, the following:

a. Eucon WR-75, Euclid Chemical Co.
b. Chemtard, ChemMasters Corp.
c. Plastocrete, 161, Sika Corp.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

1. Products: Subject to compliance with requirements, products include, but are not limited to, the following:

    a. Super P, Anti-Hydro Co., Inc.
    b. Eucon 37, Euclid Chemical Co.
    c. Superslump, Metalcrete Industries

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

1. Products: Subject to compliance with requirements, products include, but are not limited to, the following:

    a. Accelguard 80, Euclid Chemical Co.
    b. Accel-Set, Metalcrete Industries
    c. Daraset, W.R. Grace & Co.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

1. Products: Subject to compliance with requirements, products include, but are not limited to, the following:

    a. Eucon Retarder 75, Euclid Chemical Co.
    b. Daratard-17, W. R. Grace & Co.
    c. Plastiment, Sika Corporation

G. Moisture Vapor Reduction Admixture (MVRA): **For use only in concrete slabs-on-grade**. ASTM C 494, Type S. Concrete moisture vapor reduction admixture for all interior slabs on grade shall be a non-toxic, liquid admixture that is specifically designed to have a natural chemical reaction with pre-existing elements inside the concrete to eliminate the route of moisture vapor emission through the slab by restricting the integral capillary system.

1. Basis-of-Design Product: **"**Barrier One High Performance Concrete Admixture**"** manufactured by Barrier One, Inc.
2. Available Products: Subject to compliance with requirements, other products that may be incorporated into the Work include, but are not limited to the following:

    a. MVRA 900 , ISE LOGIK Industries, Gulfport, MS.

3. Provide one of the above named products or, upon approval of the Architect/Structural Engineer, and at the expense of the concrete MVRA manufacturer, provide a product that meets or exceeds the below project specific performance requirements:

    a. Independent procurement of one cylinder per day of placement of concrete containing MVRA; do not proceed without MVRA representative being present.
    b. Independent testing of all cylinders for hydraulic conductivity per ASTM D5084.
    c. Assessing each cylinder for maximum flow of 6.0 E-08 cm/sec
    d. Should any cylinder exceed the maximum flow, procure a core from that day's placement .
    e. Independently test core for hydraulic conductivity per ASTM D5084.

f. Should any core exceed the maximum flow, provide a topical moisture mitigation system for all areas not meeting the stated limit; moisture mitigation system to include all labor, material and warranty that meets or exceeds the terms of the concrete moisture vapor reduction admixture manufacturer's warranty.

4. Warranty requirements: Product must be installed according to, and in compliance with the manufacturer's published data to include, but not be limited to dosing instructions, onsite representation requirements, and the use of an ASTM E 1745 vapor retarder, installed following ASTM E 1643 and ASTM F 710 guidelines; suspended concrete slabs do not require a vapor retarder.

a. MVRA Manufacturer's warranty shall include:

a) Term: Life of the concrete.
b) Repair and/or removal of failed flooring.
c) Placement of a topical moisture remediation system.
d) Replacement of flooring materials like original installed to include material and labor.

b. MVRA Manufacturer shall provide an adhesion warranty to match the term of the adhesive manufacturer's warranty in accordance with the MVRA manufacturer's requirements for conveyance of such.

2.6 POLYPROPYLENE FIBER REINFORCEMENT

A. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C1116, Type III, 1/2 to 2-1/4 inches long. The fibers shall be placed in the concrete at the mixing plant.

B. Available Products: Subject to compliance, provide one of the following to REPLACE welded wire fabric reinforcement in concrete slabs-on-grade:

1. Grace Strux 90/40, W.R. Grace & Company, Construction Products Division
2. Novemesh 950, SI Concrete Systems
3. Forta Ferro, Forta Corporation

2.7 VAPOR BARRIER AND GRANULAR MATERIALS

A. Vapor Barrier: ASTM E 1745, Class A, membrane that satisfies the following:

1. Membrane shall not be less than 15 mils thick.
2. Installation shall comply with the "Vapor Barrier and Granular Materials" Paragraph of this specification.
3. Products: Subject to compliance with requirements, provide one of the following:

a. Stego Industries, LLC; Stego Wrap 15-mil Class A Vapor Barrier
b. Barrier-Bac, Inc.; VB-350 16 mil Class A Vapor Retarder
c. W. R. Meadows, Inc.; Sealtight Perminator 15 mil Class A Vapor Retarder

d. Insulation Solutions Inc.; Viper VaporCheck II 15 mil Class A Vapor Barrier

B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel.

2.8 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

I. Products: Subject to compliance with requirements, products to include, but are not limited to, the following:

1. Evaporation Retarder:

a. Cimfilm; Axim Concrete Technologies.
b. Finishing Aid Concentrate; Burke Group, LLC (The).
c. Spray-Film; ChemMasters.
d. Aquafilm; Conspec Marketing & Manufacturing Co., Inc.
e. Sure Film; Dayton Superior Corporation.
f. Eucobar; Euclid Chemical Co.
g. Vapor Aid; Kaufman Products, Inc.
h. Lambco Skin; Lambert Corporation.
i. E-Con; L&M Construction Chemicals, Inc.
j. Confilm; Master Builders, Inc.
k. Waterhold; Metalcrete Industries.
l. Rich Film; Richmond Screw Anchor Co.
m. SikaFilm; Sika Corporation.
n. Finishing Aid; Symons Corporation.
o. Certi-Vex EnvioAssist; Vexcon Chemicals, Inc.

2. Clear, Solvent-Borne, Membrane-Forming Curing Compound:

a. AH Clear Cure; Anti-Hydro International, Inc.
b. Spartan-Cote; Burke Group, LLC (The).
c. Spray-Cure & Seal 15; ChemMasters.
d. Conspec #1-15 percent solids; Conspec Marketing & Manufacturing Co., Inc.
e. Day-Chem Cure and Seal; Dayton Superior Corporation.
f. Diamond Clear; Euclid Chemical Co.
g. Nitocure S; Fosroc.
h. Lambco 120; Lambert Corporation.
i. L&M Dress & Seal 18; L&M Construction Chemicals, Inc.
j. CS-309; W. R. Meadows, Inc.
k. Seal N Kure; Metalcrete Industries.
l. Rich Seal 14 percent UV; Richmond Screw Anchor Co.
m. Kure-N-Seal; Sonneborn, Div. of ChemRex, Inc.
n. Flortec 14; Sternson Group.
o. Cure & Seal 14 percent; Symons Corporation.
p. Clear Seal 150; Tamms Industries Co., Div. of LaPorte Construction Chemicals of North America, Inc.
q. Acrylic Cure; Unitex.
r. Certi-Vex AC 309; Vexcon Chemicals, Inc.

3. Clear, Waterborne, Membrane-Forming Curing Compound:

a. AH Clear Cure WB; Anti-Hydro International, Inc.
b. Klear Kote WB II Regular; Burke Chemicals.
c. Safe-Cure & Seal 20; ChemMasters.
d. High Seal; Conspec Marketing & Manufacturing Co., Inc.
e. Safe Cure and Seal; Dayton Superior Corporation.
f. Aqua Cure VOX; Euclid Chemical Co.
g. Cure & Seal 309 Emulsion; Kaufman Products Inc.
h. Glazecote Sealer-20; Lambert Corporation.
i. Dress & Seal WB; L&M Construction Chemicals, Inc.
j. Vocomp-20; W. R. Meadows, Inc.
k. Metcure; Metalcrete Industries.
l. Cure & Seal 150E; Nox-Crete Products Group, Kinsman Corporation.
m. Rich Seal 14 percent E; Richmond Screw Anchor Co.
n. Kure-N-Seal WB; Sonneborn, Div. of ChemRex, Inc.
o. Florseal W.B.; Sternson Group.
p. Cure & Seal 14 percent E; Symons Corporation.
q. Seal Cure WB 150; Tamms Industries Co., Div. of LaPorte Construction Chemicals of North America, Inc.
r. Hydro Seal; Unitex.
s. Starseal 309; Vexcon Chemicals, Inc.

4. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound:

a. Spray-Cure & Seal Plus; ChemMasters.
b. UV Super Seal; Lambert Corporation.
c. Lumiseal Plus; L&M Construction Chemicals, Inc.

d. CS-309/30; W. R. Meadows, Inc.
e. Seal N Kure 30; Metalcrete Industries.
f. Rich Seal 31 percent UV; Richmond Screw Anchor Co.
g. Cure & Seal 31 percent UV; Symons Corporation.
h. Certi-Vex AC 1315; Vexcon Chemicals, Inc.

5. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound:

a. Klear-Kote Cure-Sealer-Hardener, 30 percent solids; Burke Group, LLC (The).
b. Polyseal WB; ChemMasters.
c. UV Safe Seal; Lambert Corporation.
d. Lumiseal WB Plus; L&M Construction Chemicals, Inc.
e. Vocomp-30; W. R. Meadows, Inc.
f. Metcure 30; Metalcrete Industries.
g. Vexcon Starseal 1315; Vexcon Chemicals, Inc.

2.9 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Semi-rigid Joint Filler: Two-component, semi-rigid. 100 percent solids per ASTM D 2240.

C. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:

1. Type: Class IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Reglets: Fabricate reglets of not less than 0.0217-inch- thick galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

E. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

F. Waterstops: Flexible PVC waterstops for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes. Use profile of ribbed surface with center bulb. The waterstop is to be embedded 3 inches into concrete unless noted otherwise on drawings.

2.10 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4,100 psi at 28 days when tested according to ASTM C 109/C 109M.
5. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch.

    a. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
    b. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
    c. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
    d. Compressive Strength: Not less than 5700 psi at 28 days when tested according to ASTM C 109.

2.11 CONCRETE MIXTURES, GENERAL

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301 and ACI 318-02.
2. Under circumstances where laboratory trial mix or field test data are not available, the required average compressive strength of concrete produced with materials similar to those specified shall be at least 1,200 psi greater than the specified compressive strength. This alternative shall not be permitted if the specified compressive strength is greater than 4,000 psi.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 18 percent.
2. Ground Granulated Blast-Furnace Slag: 50 percent.

D. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:

1. Air Content: 6 percent for 3/4-inch nominal maximum aggregate size.

E. Do not air entrain concrete to trowel-finished interior floors and suspended slabs. Do not allow entrapped air content to exceed 3 percent.

F. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

G. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings and Foundation/Retaining Walls: Proportion normal-weight concrete mix as follows:

1. Minimum Compressive Strength (28 Days): 3000 psi.
2. Select slump limits from subparagraphs below or revise to suit Project.
3. Maximum Slump: 4 inches.
4. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8 inches after admixture is added to concrete with 2 to 4 inch slump.

B. Interior Slabs-on-Grade: Proportion normal-weight concrete mix as follows:

1. Minimum Compressive Strength (28 Days): 3500 psi.
2. Select cementitious materials content from subparagraphs below or delete if ACI 301 default for floors is sufficient. ACI 302.1R recommends quantities in listed order below, for nominal maximum aggregate sizes 1-1/2, 1, and 3/4 inch (38, 25, and 19 mm). ACI 301 sets identical quantities, but for minimum cement rather than cementitious materials content.
3. Minimum Cementitious Materials Content: 520 lb/cu. yd.
4. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8-inches after admixture is added to concrete .
5. Interior slab mix is to contain a high-range, water-reducing admixture with a water cement ratio equal to 0.47.
6. Produce a mix that has the minimum amount of water necessary to generate a 2 to 3 inch slump prior to the addition of any water reducing admixtures, as recommended in ACI 302.1R, “Concrete Floor and Slab Construction”, Chapter 6, “Concrete Properties and Consistency”.
7. Reinforce concrete with polypropylene fiber reinforcement at a dosage rate specified by fiber reinforcement manufacturer. Reinforcement to be placed in concrete at the mixing plant per fiber reinforcement manufacturer’s recommendations.
8. Per ACI 544.3, mix designs for concrete containing fiber reinforcement shall include a maximum 55% by volume course aggregate content by total volume of aggregates (sand and stone).

C. Suspended Slabs: Proportion normal-weight concrete mix as follows:

1. Minimum Compressive Strength (28 Days): 3500 psi.
2. Minimum Cementitious Materials Content: 520 lb/cu. yd.
3. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8-inches after admixture is added to concrete .
4. Interior slab mix is to contain a high-range, water-reducing admixture with a water cement ratio equal to 0.47.
5. Produce a mix that has the minimum amount of water necessary to generate a 2 to 3 inch slump prior to the addition of any water reducing admixtures, as recommended in ACI 302.1R, “Concrete Floor and Slab Construction”, Chapter 6, “Concrete Properties and Consistency”
6. Reinforce concrete with welded wire fabric per contract documents and supported per Paragraph 3.5.E. The use of polypropylene fiber reinforcement is not allowed without the permission of the Engineer-Of-Record.

D. Exterior Slabs-on-Grade and Sidewalks: See Division 32 Section “Concrete Pavement.”

2.13 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice”.

2.14 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information for EACH delivery to the Project site.

1. When air temperature is between 85 and 90 deg. F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch for concrete exposed to view.
2. Class B, 1/4 inch for all other concrete surfaces.

D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

1. Do not use rust-stained steel form-facing material.

E. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

F. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

G. Chamfer exterior corners and edges of permanently exposed concrete.

H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor bolts, accurately located, to elevations required.
2. Install reglets to receive top edge of foundation sheet 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. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that do not support the weight of concrete may be removed after cumulatively curing at not less than 50 deg. F for 24 hours after placing concrete provided concrete is hard enough to not be

damaged by form-removal operations and provided curing and protection operations are maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR BARRIER AND GRANULAR MATERIAL

A. Vapor Barrier: Place, protect, and repair membrane according to ASTM E 1643, ASTM F 710 and manufacturer's written instructions. Contractor shall place the vapor barrier directly below the concrete slab and on top of granular fill. Lap joints 6 inches minimum and seal with manufacturer's recommended tape. Sheets to extend to interior face of foundation walls, turn up vertically and terminate flush with top of concrete floor slab. Adhere to foundation wall with manufacturer's recommended tape. Seal all penetrations with manufacturer's recommended methods of boots, mastic or tape.

B. Granular Fill: Place a minimum of 4 inches compacted granular fill on top of subgrade to elevation tolerances of plus 0 inch or minus 1/2 inch.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in longest practicable lengths on bar supports spaced at 3'-0" maximum spacing to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts or inserts.

1. Grooved Joints Using Inserts: Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. After concrete has cured, remove inserts and clean groove of loose debris.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8 inch wide joints to a depth of one-third the slab thickness. Cut into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
3. Clean all debris from joints.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 7 Section "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. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.

1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Before placing concrete, water may not be added at Project site, unless there is a specific written indication on the delivery slip of how much water has not been added to the mix at the mixing plant.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mix. The addition of fiber reinforcement to concrete for slab construction will reduce field tested concrete slumps. The lower slump values for concrete that contain fiber reinforcement will not reduce workability of the concrete. Per ACI 302, the workability of a concrete mixture is not directly proportional to the slump. The addition of water at the project site to increase slump will likely result in excessive bleed water during finishing operations and is not permitted. Contractor shall contact fiber reinforcement representative to address any concerns with concrete workability and field tested slumps.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to, or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg. F and not more than 80 deg. F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

F. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg. F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
2. Do not apply rubbed finish to smooth-formed finish.

C. Rubbed Finish: Apply the following to smooth-formed finished concrete:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.9 WATERSTOPS

A. Flexible Waterstops: Install in construction joints and at other joints to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacture's written instructions.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Concrete placement conditions should satisfy the following requirements to reduce random slab cracking:

1. The base shall be free of frost and should not contain standing water. If concrete is placed in hot, dry conditions, the base should be lightly damped with water in advance of concreting.
2. When slabs are placed on grade, there should be no more than 30 deg. F difference between the temperature of the base and concrete at the time of placement.
3. Ideally, concrete should be protected from sun and wind and be placed after floor or roof deck is installed.

C. Requirements for finishing slabs with fiber reinforcement:

1. The use of vibratory screeds per standard ACI recommendations is required.
2. Consult fiber manufacturer representative if bleed water appears during finishing operations. Removing bleed water by any means other than natural evaporation will likely expose fibers in the finished surface.
3. Conduct power trowel operations as late as possible per standard ACI recommendations.

D. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes.

1. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finishes.

E. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

F. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system
2. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155 for a randomly trafficked floor surface:

    a. Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.
    b. Specified values of flatness shall be based on “10-ft straightedge method” for suspended slabs. Flatness shall be within 1/8-inch per 10-ft for four of five consecutive measurements. In addition, visually obvious faults in floor flatness shall be corrected at contractor’s own expense.

G. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

H. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

3.12 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods for unformed surfaces.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with Plastic Sheet cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches. Cure for not less than 24 hours.

    a. Cure concrete surfaces to receive floor coverings with a Plastic Sheet cover for 24 hours or a curing compound that the manufacturer recommends for use with floor coverings.

2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
3. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semi-rigid epoxy joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Fill joint in a manner that provides a finish at the joint which is flush with the surrounding surface of the slab.

D. Joint filling is not required for 1/8-inch wide control joints.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to

manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks less than 0.01 inch wide and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks less than 0.01 inch wide and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar. All removal and repairs shall be at Contractor’s own expense.

F. Repair materials and installation not specified above may be used, subject to Architect’s approval. All removal and repairs shall be at Contractor’s own expense.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article. See above Paragraph 2.5.G.3 for testing and performance requirements at the expense of the concrete moisture vapor reduction admixture (MVRA) manufacturer.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 30 cu. yd. or fraction thereof.
2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens:

a. ASTM C 31; cast and laboratory (standard) cure one set of three standard cylinder specimens for each composite sample. Transport the cylinders to laboratory within 24 hours for final curing and testing.
b. ASTM C 31; cast and field cure one standard cylinder specimens for each composite sample. Field cure the cylinders for the first five (5) days, minimum, in the filed under the same conditions as the cast concrete. Transport the cylinders to the laboratory for continued curing and testing.

6. Compressive-Strength Tests:

a. ASTM C 39; test one laboratory (standard) cured specimen at 7 days and 2 specimens at 28 days.
b. ASTM C 39; test field cured specimen at 7 days.

C. When strength of field-cured cylinders is less than 85 percent of companion cylinders that have been totally cured in the laboratory (no field curing), Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

D. A 28 day compressive-strength test for concrete shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

E. Strength of concrete will be satisfactory if every average of sets of three consecutive compressive-strength tests at 28 days (total of 6 cylinders) equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

F. If time of concrete strength gain is affected by materials in the mix, such as fly ash, provide correlation information between the 28-day compressive strength and the final compressive strength prior to performing compressive strength tests.

G. Non-destructive 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.

H. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. The Contractor will be notified of the tests and the tests will be paid for by the Contractor. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

END OF SECTION 033000

SECTION 055000 - METAL FABRICATIONS

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. Loose bearing plates.
2. Loose steel lintels.
3. Steel framing and supports for applications where framing and supports are not specified in other Sections.
4. Steel weld plates and angles for casting into concrete not specified in other Sections.
5. Steel ladders.
6. Metal bollards.

B. Related Sections include the following:
1. Division 3 Section “Cast in Place Concrete”
2. Division 9 Section “Painting”
3. Division 13 Section “Fire Training Simulator Equipment”

1.3 SUBMITTALS

A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. Steel ladders.
2. Miscellaneous steel trim including steel angle corner guards and loading dock edge angles.
3. Metal bollards.

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

C. Welding certificates: Copies of certificates for welding procedures and personnel.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing metal fabrications 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 results.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.5 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.6 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design ladders.

B. Structural Performance of Ladders: Ladders shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3 and as noted in the contract documents.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

2.2 METALS, GENERAL

A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

2.3 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M, except all wide flange shapes shall conform to ASTM A992.

B. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500, Grade B.

C. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

D. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

E. Headed Stud-type Shear Connectors: ASTM A108, Grade 1015 or 1020, cold-finished carbon steel with dimensions complying with AISC specifications.

2.4 FASTENERS

A. Bolts and Nuts: ASTM A325, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers, uncoated.

B. Anchor Bolts: ASTM F 1554, Grade 36, galvanized for members on the exterior of the building and in exterior walls, uncoated for interior members.

C. Machine Screws: ASME B18.6.3.

D. Lag Bolts: ASME B18.2.1.

E. Wood Screws: Flat head, ASME B18.6.1.

F. Plain Washers: Round, ASME B18.22.1.

G. Lock Washers: Helical, spring type, ASME B18.21.1.

H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below.

1. Material: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Toggle Bolts: FS FF-B-588, tumble wing type, class and style as needed.

2.5 GROUT

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Shear and punch metals cleanly and accurately. Remove burrs.

C. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

E. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

F. Cut, reinforce, drill and tap metal fabrications as indicated to receive finish hardware, screws and similar items.

G. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

H. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

I. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

J. Remove sharp or rough areas on exposed traffic surfaces.

K. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

2.7 LOOSE BEARING PLATES

A. Provide loose bearing plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

2.8 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.

B. Weld adjoining members together to form a single unit where indicated.

2.9 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from structural steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors 1 ¼ inches wide by ¼ inch thick by 8 inches long at 24 inches o.c., unless otherwise indicated.
2. Furnish inserts if units are installed after concrete is placed.

2.10 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 inches from each end, 6 inches from corners, and 24 inches o.c., unless otherwise indicated.

2.11 STEEL LADDERS

A. General:

1. Comply with ANSI A14.3 unless otherwise indicated.
2. For elevator pit ladders, comply with ASME A17.1.

B. Steel Ladders:

1. Space siderails 16 inchesapart unless otherwise indicated.
2. Siderails: Continuous, 1/2-by-2-1/2-inchsteel flat bars, with eased edges.
3. Rungs: 3/4-inch diameter steel bars.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
6. Support each ladder at top and bottom and not more than 60 incheso.c. with welded or bolted steel brackets.
7. Galvanize exterior ladders, including brackets and fasteners.
8. Prime exterior ladders, including brackets and fasteners, with zinc-rich primer.

2.12 METAL BOLLARDS

A. Fabricate metal bollards from 1/4-inch wall-thickness steel pipe.

1. Cap bollards with 1/4-inch- thick steel plate.

B. Fabricate bollards for embedding into concrete.

2.13 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

2.14 FINISHES, GENERAL

A. Paint all metal components.

B. All exterior metals not listed in High Performance coatings to be galvanized and painted. Use primer formulated for galvanized finish.

C. Refer to division 09 sections “Painting” and “High Performance Coatings” for finishing requirements.

2.15 STEEL FINISHES

A. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1A): SSPC-SP3, “Power Tool Cleaning”.
2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

B. Apply shop primer to uncoated surfaces of metal fabrications. Apply primer paint to steel that embedded in concrete, except anchor bolts, their nuts and washers, and column leveling plates.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."

D. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

1. Galvanize all exterior lintels, stairs, guardrails, and handrails.
2. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
3. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
4. Refer to Division 9 Section “Painting.”

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners necessary for securing metal fabrications to in-place construction. Include threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

B. Cutting, Fitting and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plum, true and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size

limitations. Do not weld, cut or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

E. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap
3. Remove welding flux and slag immediately
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.2 SETTING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

1. Use nonshrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 INSTALLING METAL BOLLARDS

A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.

B. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete. Fill annular space around bollard solidly with nonshrink grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward bollard.

3.4 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings, if any.

3.5 ADJUSTING AND CLEANING

A. Field Welds: Immediately after erection, clean field welds that will be exposed to view in the final structure, field welds on the exterior of the building and in exterior walls. Clean all slag from the welds. Remove all flux with a solvent that will not prevent adhesion of paint.

END OF SECTION 05500

SECTION 055113 – METAL STAIRS AND RAILINGS

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. Preassembled steel stairs with open grate treads.
2. Steel guardrail, railing, and handrail systems.

B. Related Requirements:

1. Division 03 Section "Cast-in-Place Concrete" for concrete slabs on grade and elevated slabs.

1.3 COORDINATION

A. Coordinate installation of anchorages for metal stairs. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Coordinate locations of hanger rods and struts with other work so that they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.

1.4 ACTION SUBMITTALS

A. Product Data: For metal grate stairs and the following:

1. Open grate metal stair treads.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

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

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.6 QUALITY ASSURANCE

A. Refer to Structural Drawings “Architecturally Exposed Structural Steel Framing” for the requirements of all exposed steel including railings.

B. Installer Qualifications: Fabricator of products.

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stairs and railings.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft.
2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/360.

C. Structural Performance of Handrails and Railings. Provide handrails and railings capable of withstanding the following structural loads without exceeding allowable design working stress of materials for handrails, railings, anchors, and connections:

1. Top Rail of Guards: Capable of withstanding the following loads applied as indicated:

a. Concentrated load of 200 lbf applied at any point and in any direction.
b. Uniform load of 50 lb. per linear foot applied horizontally and concurrently with uniform load of 50 lb. per linear foot applied vertically downward.
c. Concentrated and uniform loads above need not be assumed to act concurrently.

2. Handrails Not Servicing As Top Rails: Capable of withstanding the following loads applied as indicated:

a. Concentrated load of 200 lbf applied at any point and in any direction.
b. Uniform load of 50 lbf/ft. applied in any direction.
c. Concentrated and uniform loads above need not be assumed to act concurrently.

3. Infill area of Guards: Capable of withstanding a horizontal concentrated load of 50 lb. applied to 1 sq. ft. at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area.

   a. Load above need not be assumed to act concurrently with loads on top rails in determining stress on guard.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Steel Bars for Grating Treads: ASTM A 36/A 36M or steel strip, ASTM A 1011/A 1011M or ASTM A 1018/A 1018M.

D. Wire Rod for Grating Crossbars: ASTM A 510

E. Steel Tubing: ASTM A 513.

F. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M structural steel, Grade 25, unless another grade is required by design loads; exposed.

G. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, structural steel, Grade 30, unless another grade is required by design loads.

H. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

I. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

J. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 304.

K. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.

L. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.

M. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.

2.3 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for exterior stairs.

D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

E. Provide Type 304 stainless steel fasteners for Natatorium use

1. Select fasteners for type, grade, and class required.

2.4 FASTENERS - RAILINGS

A. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

B. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Shop Primers: Provide primers that comply with Division 09 Section "Painting."

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.6 STEEL-FRAMED STAIRS

A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," Commercial Class, unless more stringent requirements are indicated.

B. Stair Framing:

1. Fabricate stringers of steel tubes

a. Provide closures for exposed ends of tube stringers.

2. Construct platforms of steel tube headers and miscellaneous framing members as needed to comply with performance requirements.
3. Weld stringers to headers; weld framing members to stringers and headers.
4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

C. Metal Stairs: Form risers, treads, and platforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch.
1. Directly weld metal treads to stringers; locate welds where they are concealed. Do not weld risers to stringers.
2. Attach risers and treads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.

2.7 STAIR GUARDRAILS AND RAILINGS

A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint as shown in NAAMM AMP 521.

C. Form changes in direction of railings as follows:

1. By inserting prefabricated flush-elbow fittings.

D. Close exposed ends of railing members with prefabricated end fittings.

E. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

F. Connect posts to stair framing by direct welding unless otherwise indicated.

G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.

1. For exterior and interior galvanized railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.
2. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.8 FABRICATION, GENERAL

A. As a minimum standard, comply with the requirements of Division 05 Section “Architecturally Exposed Structural Steel Framing”

B. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding unless otherwise indicated.
2. Use connections that maintain structural value of joined pieces.

C. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

D. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

E. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

F. Form exposed work with accurate angles and surfaces and straight edges.

G. Weld connections to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Weld exposed corners and seams continuously unless otherwise indicated.
5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 2 welds.

H. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners. Locate joints where least conspicuous.

2.9 FABRICATION, RAILINGS

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

D. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

E. Connections: Fabricate railings with welded connections unless otherwise indicated.

F. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

G. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

H. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

I. For removable railing posts, fabricate slip-fit sockets from stainless-steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height. Provide socket covers designed and fabricated to resist being dislodged.

1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

J. Toe Boards: At Mezzanines, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.10 FINISHES

A. All metal stair, guardrail and railing components to be galvanized, meeting the requirements of ASTM A123.

PART 3 - EXECUTION

3.1 INSTALLING METAL STAIRS

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior and interior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

F. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

G. Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."

3.2 INSTALLING GUARDRAILS & RAILINGS

A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:

B. Attach handrails to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as required to comply with performance requirements and as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members. Or use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.3 ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

3.4 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055113

SECTION 061000 ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fire-retardant sheathing
2. Fire-retardant blocking and Plywood

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.
3. RIS: Redwood Inspection Service.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

4. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Power-driven fasteners.
4. Powder-actuated fasteners.
5. Expansion anchors.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

3. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

D. Application: Treat all rough carpentry blocking & plywood where indicated on the construction documents.

2.4 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 3 grade, any species.

2.5 MISCELLANEOUS LUMBER

General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.

B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber of any species.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine; No. 2 grade; SPIB.
2. Hem-fir or hem-fir (north); Standard or No. 3 Common grade; NLGA, WCLIB, or WWPA.
3. Eastern softwoods; No. 2 Common grade; NeLMA.
4. Northern species; No. 2 Common grade; NLGA.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 PLYWOOD BACKING PANELS

A. Electrical and Control Equipment Backing Panels: DOC PS 1, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153 or Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. All permanent wood products installed on this project including but not limited to framing, blocking, nailers, sheathing and backer panels are to be fire-retardent.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

D. Install plywood backing panels by fastening to studs or masonry; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

E. Shear Wall Panels: Install shear wall panels to comply with manufacturer's written instructions.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, tv brackets, trim, and other equipment shown on the drawings as Owner furnished equipment.

G. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

H. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

J. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal-size furring as indicated.

3.4 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 073130 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 STIPULATIONS

A. The specifications sections “General Conditions”, “Special Requirements” and “General Requirements” form a part of this section by reference thereto and shall have the same force and effect as if printed herewith in full.

1.2 SUMMARY

A. This Section includes the following:

1. Asphalt shingles.
2. Felt underlayment.

B. Related Sections include the following:

1. Division 6 Section "Sheathing" for roof deck wood structural panels.
2. Division 7 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings and counterflashings not part of this Section.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of asphalt shingle, ridge and hip cap shingles, ridge vent, and exposed valley lining indicated.

1. Include similar Samples of trim and accessories involving color selection.

C. Samples for Verification: For the following products, of sizes indicated, to verify color selected.

1. Asphalt Shingle: Full-size asphalt shingle strip.
2. Ridge and Hip Cap Shingles: Full-size ridge and hip cap asphalt shingle.
3. Self-Adhering Underlayment: 12 inches square.

D. Qualification Data: For Installer, including certificate signed by asphalt shingle manufacturer stating that Installer is approved, authorized, or licensed to install roofing system indicated.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.

F. Research/Evaluation Reports: For asphalt shingles.

G. Maintenance Data: For asphalt shingles to include in maintenance manuals.

H. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: The manufacturer shall have a minimum of ten (10) years experience in the production of the type of roofing herein specified, and shall be able to show experience with projects of similar size and complexity.

B. Installer Qualifications: The installer shall have a minimum of five (5) years experience installing the type of roofing herein specified on projects of similar size and complexity.

C. Source Limitations: Obtain ridge and hip cap shingles ridge vents, felt underlayment, and self-adhering sheet underlayment through one source from a single asphalt shingle manufacturer.

D. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.

1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.
2. Do not install shingles when the ambient, or wind chill factor, is below 45 degrees Fahrenheit.

1.8 CONTRACTOR'S WARRANTY

A. Contractor's Responsibility: The General Contractor shall take, or cause to have taken, any and all corrective measures necessary to keep the roofing system free of all defects, to the satisfaction of the Owner and to maintain the roofing system in a watertight condition. The contractor shall have the responsibility for said corrective measures for two (2) years after the date of Final Inspection. Then the Contractor shall be responsible for the removal and replacement of the roofing system, if in the judgment of the Owner, removal and replacement is necessary to keep the roofing system free of all effects or to maintain the roofing system in a watertight condition. The Contractor shall also repair, or remove and replace, if the Owner deems it to be necessary, or any part of the building, including the interior, damaged as a result of leaks in the roofing system. The interior of the building includes, but is not limited to, the furnishings and fixtures. There shall be no limit to the Contractor's liability for fulfilling the aforementioned responsibilities.

1. Final Inspection shall include a statement, supplied by the Contractor and signed by an authorized representative of the roofing manufacturer, attesting to the fact that the roofing installation and finished condition is acceptable for warranty by the manufacturer.

B. Exclusions: The Contractor shall not be responsible for repairs to, or replacement of, the roofing system, if repairs or replacement is necessary due to a natural disaster, such as lightning, flood, tornado or earthquake.

C. Notification: The Owner will notify the Contractor, as soon as reasonable possible, after it has knowledge of defects in the roofing system. Should the Contractor fail to promptly take corrective measures, the Owner may undertake corrective measures. The Contractor shall be responsible for any and all expenses incurred by the Owner in undertaking the necessary corrective measures. In addition, the Owner's undertaking of corrective measures shall in no way relieve the Contractor of any of the aforementioned responsibilities.

1.9 MANUFACTURER'S WARRANTY

A. The General Contractor shall provide the Owner with a thirty (30) year warranty, furnished by the manufacturer, which shall warrant that the said manufacturer will repair any leaks in the roofing system, not to exceed the original cost of the installed roof over the life of the warranty, installed by an applicator authorized by said manufacturer. The first ten (10) years of the warranty shall not be prorated.

B. Leaks from the following causes shall be covered by the manufacturer's warranty:

1. Defects in the roofing system material.
2. Workmanship of the authorized applicator.

C. The following exclusions are permitted in the manufacturer's warranty:

1. Natural disasters such as lightning, hail, floods, tornadoes or earthquakes.
2. Damage from traffic or storage of materials on the roof.
3. Structural failure of roof deck, parapet or coping.
4. Infiltration of moisture in, through or around walls, coping or building structure.
5. Movement of deterioration of metal counterflashing or other metal components adjacent to the roof.
6. Damage to the building (other than roofing and insulation) or its components adjacent to the roof.

D. The warranty shall provide that in the event a leak should occur within the warranty period, and if such leak is within the coverage of the warranty, the warrantor will, at no expense to the Owner, make or have made, all necessary repairs to put the roof membrane, base flashing and roof insulation in a dry and watertight condition, using the same materials and specifications as the original application. There will be no limit to the warrantor's liability for making such repairs over the period of the warranty.

E. The warranty shall provide that if, upon proper notification, the warrantor fails to promptly repair the roof, the Owner may make temporary repairs to avoid damage to the facility. Such action shall not be considered a breach of the provisions of the warranty.

F. The Owner shall be permitted to make alterations, additions and repairs to the roof, within the written approved guidelines of the warrantor without jeopardizing the unexpired portion of the warranty's original term.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. SBS Modified Asphalt/Fiberglass Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, Class "A" Fire Rating and self-sealing.

1. Available Products:

a. Atlas Roofing Corporation; StormMaster Slate (specified)
b. Celotex Corporation;
c. CertainTeed Corporation;
d. GAF Materials Corporation;
e. Georgia-Pacific Corporation;
f. Owens Corning;
g. TAMKO Roofing Products, Inc.;

2. One-piece oversized: 18½" x 22-11/16" with 8½" exposure
3. Algae Resistance: Granules treated to resist algae discoloration.
4. Color and Blends: As selected by Architect from manufacturer's full range.
5. Hip and Ridge Shingles: Manufacturer's standard, factory-precut units to match asphalt shingles.

2.3 UNDERLAYMENT MATERIALS

A. Felts: ASTM D 146 and D 1922, Class A fire rated building paper.

2.4 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, or hot-dip galvanized steel wire shingle nails, minimum 0.120-inch diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch minimum diameter.

2.5 METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

1. Apron Flashings: Fabricate with lower flange a minimum of 5 inches over and 4 inches beyond each side of downslope asphalt shingles and 6 inches up the vertical surface.
2. Step Flashings: Fabricate with a headlap of 2 inches and a minimum extension of 5 inches over the underlying asphalt shingle and up the vertical surface.
3. Cricket Backer Flashings: Fabricate with concealed flange extending a minimum of 24 inches beneath upslope asphalt shingles and 6 inches beyond each side of the chimney and/or web and 6 inches above the roof plane.
4. Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof deck flange wide enough to extend 1-½" below the new insulation board and existing wood deck, and a fascia flange with 3/8-inch drip at lower edge.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Single-Layer Felt Underlayment: Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches underlying

course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches in direction to shed water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.

B. Double-Layer Felt Underlayment: Install double layers of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Install a 19-inch wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches in shingle fashion. Lap ends a minimum of 6 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails.

1. Apply a continuous layer of asphalt roofing cement over starter course and on felt underlayment surface to be concealed by succeeding courses as each felt course is installed. Apply over entire roof].
2. Install felt underlayment on roof sheathing not covered by self-adhering sheet underlayment. Lap edges over self-adhering sheet underlayment not less than 3 inches in direction to shed water.
3. Terminate felt underlayment extended up not less than 4 inches against sidewalls, curbs, chimneys and other roof projections.

C. Install self-adhered EPDM ice damn from the bottom edge of sheathing to at least 3’ toward the high point of the roof.

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

C. Step Flashings: Install with a headlap of 2 inches and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

D. Cricket Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.

E. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

F. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

3.4 ASPHALT SHINGLE INSTALLATION

A. Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed at least 7 inches with self-sealing strip face up at roof edge.

1. Extend asphalt shingles 3/4 inch over fascia at eaves and rakes.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full length first course followed by cut second course, repeating alternating pattern in succeeding courses.

F. Fasten asphalt shingle strips with roofing nails located according to manufacturer's written instructions.

1. Where roof slope exceeds 20:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
3. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.

G. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

3.5 ROOFING INSTALLER'S WARRANTY

A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <Insert name of Owner.>
2. Address: <Insert address.>
3. Building Name/Type: <Insert information.>

4. Address: <Insert address.>
5. Area of Work: <Insert information.>
6. Acceptance Date: <Insert date.>
7. Warranty Period: <Insert time.>
8. Expiration Date: <Insert date.>

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

    a. lightning;
    b. peak gust wind speed exceeding 100 mph;
    c. fire;
    d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    f. vapor condensation on bottom of roofing; and
    g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or

deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

END OF SECTION 07313

SECTION 074213 – METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Exposed-fastener, lap-seam metal wall panels.

B. Related Sections:

1. Section 076200 "Sheet Metal Flashing & Trim" for metal panel trim.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review of procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 3" = 1'-0" (1:5).

C. Calculations:

1. Include calculations with registered engineer seal, verifying wall panel and attachment method resist wind pressures imposed on it pursuant to applicable building codes.

D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

E. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches (305 mm) long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Manufacturer.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Manufacturer Qualifications: Company specializing in Architectural Sheet Metal Products.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly 6’-0” wide x 6’-0” tall, including corner, soffits, supports, attachments, and accessories.
2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Remove strippable protective covering on metal panels as panels are being installed. Do not leave the film on installed panels.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Galvalume Substrate 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 or perforating.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: 20 years and 6 months from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, chipping, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 29 percent.

B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.
2. Deflection Limits: For wind loads, no greater than 1/180 of the span.

C. Air Infiltration: Air leakage of not more than 0.01 cfm/sq. ft. (0.05 L/s per sq. m) when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa)

D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).

2.2 EXPOSED-FASTENER, LAP-SEAM METAL WALL PANELS (EXTERIOR METAL WALL PANEL SYSTEM)

A. General: Provide factory-formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.

B. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and a flat pan between major ribs.

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 following:

a. Basis-of-Design Product: Berridge Manufacturing Company; Deep Deck
b. Innovative Metals Company, Inc. (IMETCO).
c. MBCI
d. Fabral Metal Wall and Roof Systems
e. Centria

2. Metallic-Coated Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Nominal Thickness: 0.029 inch (0.74 mm).
b. Exterior Finish: Two-coat fluoropolymer
c. Color: As selected by Architect from manufacturer's full range.

3. Major-Rib Spacing: 7.2 inches (182mm) o.c.
4. Panel Coverage: 36 inches (914 mm).
5. Panel Height: 1.5 inches (38 mm).

2.3 EXPOSED FASTENER -FASTENER, LAP-SEAM METAL WALL PANELS (INTERIOR METAL WALL PANELS)

A. Self- Provide factory-formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.

B. Corrugated-Profile, Exposed-Fastener Metal Wall Panels: Formed with alternating curved ribs spaced at 2.67 inches (68 mm) o.c. across width of panel.

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 following:

    a. Basis-of-Design Product: Berridge Manufacturing Company; S-Deck.
    b. Innovative Metals Company, Inc. (IMETCO).
    c. MBCI
    d. Fabral Metal Wall and Roof Systems
    e. Centria

2. Metallic-Coated Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

    a. Nominal Thickness: 0.029 inch (0.74 mm).
    b. Exterior Finish: Two-coat fluoropolymer.
    c. Color: As selected by Architect from manufacturer's full range.

3. Rib Spacing: 2.67 inches (68 mm) o.c.
4. Panel Coverage: 34.67 inches (881 mm).
5. Panel Height: 0.875 inch (22 mm).

2.4 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275) hot-dip galvanized coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) 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, 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 rakes, 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, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal 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 factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.5 FABRICATION

A. General: 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. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.6 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are 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.

C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.75± 0.05 mil (0.019± 0.0013 mm) over 0.2± 0.05 mil (0.05± 0.0013 mm) primer coat, to provide a total dry film thickness of 0.95± 0.10 mil (0.024± 0.0025 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.

6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
9. Isolate dissimilar metals and masonry or concrete from metals with bituminous coating. Use gasketed fasteners where required to prevent corrosive action between fastener, substrate, and panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use stainless-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. 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.
5. Flash and seal panels with weather closures at perimeter of all openings.

E. 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 (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.
4. Seal laps and joints in accordance with wall panel system manufacturer's product data.

F. Metal Liner Panels: Install panels on exterior side of girts, with girts exposed to the interior.

G. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

H. 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.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 FIELD QUALITY CONTROL

A. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.

C. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.

D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as

recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213

SECTION 076200 SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes sheet metal flashing and trim in the following categories:

1. Scupper flashing.
2. Exposed trim and fascia.
3. Metal flashing.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 7 Section "Metal Wall Panel" for flashing installed integral to wall panels system work.
2. Division 7 Section "Joint Sealant" for elastomeric sealants.
3. Division 7 Section “Asphalt Shingles” for flashing and roofing accessories installed integral with roofing as part of roofing-system work.

1.3 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

B. Fabricate and install flashings at roof edges to comply with recommendations of FM Loss Prevention Data Sheet 1-49 for the following wind zone:

1. Wind Zone 2: Wind pressures of 31 to 45 psf.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data including manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.

C. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.

D. Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.

1. 8-inch- square Samples of specified sheet materials to be exposed as finished surfaces.
2. 12-inch- long Samples of factory-fabricated products exposed as finished Work. Provide complete with specified factory finish.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

1.6 PROJECT CONDITIONS

A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 METALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:

1. Anodized Finish: Apply the following coil-anodized finish (flashing):

a. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

2. High-Performance Organic Coating Finish (exposed trim and fascia): Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.

a. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 1402.

1) Color and Gloss: to be selected from manufacturers standard color range.

B. Galvanized Steel Sheet (for work not exposed to view): ASTM A 526, G 90, commercial quality, or ASTM A 527, G 90, lock-forming quality, hot-dip galvanized steel sheet with 0.20 percent copper, mill phosphatized where indicated for painting; not less than 0.0396 inch thick, unless otherwise indicated.

C. Aluminum-Zinc Alloy-Coated Steel Sheet (for work not exposed to view): ASTM A 792, Class AZ-50 coating, Grade 40 or to suit project conditions, with 55 percent aluminum, not less than 0.0396 inch thick, unless otherwise indicated.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Solder: ASTM B 32, Grade Sn50, used with rosin flux.

B. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

C. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat.

D. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

E. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants."

F. Epoxy Seam Sealer: 2-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.

G. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

H. Paper Slip Sheet: 5-lb/square red rosin, sized building paper conforming to FS UU-B-790, Type I, Style 1b.

I. Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- thick black polyethylene film, resistant to decay when tested according to ASTM E 154.

J. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

K. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

2.3 FABRICATION, GENERAL

A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

D. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

E. Expansion Provisions: Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

G. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.

1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.4 SHEET METAL FABRICATIONS

A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.

B. Roof Drain Flashing: Fabricate from the following material:

1. Lead-coated Copper: 12 oz./sq. ft.

C. Exposed Trim and Fasciae: Fabricate from the following material:

1. Aluminum: 0.050 inch thick.

D. Base Flashing: Fabricate from the following material:

1. Aluminum: 0.040 inch thick.

E. Scuppers & Counterflashing: Fabricate from the following material:

1. Aluminum: 0.0320 inch thick.

F. Flashing Receivers: Fabricate from the following material:

1. Aluminum: 0.0320 inch thick.

G. Drip Edges: Fabricate from the following material:

1. Aluminum: 0.0320 inch thick.

H. Eave Flashing: Fabricate from the following material:

1. Aluminum: 0.0320 inch thick.

I. Equipment Support Flashing: Fabricate from the following material:

1. Lead-coated Copper: 16 oz./sq. ft.

K. Roof Penetration Flashing: Fabricate from the following material:

1. Lead-coated Copper: 16 oz./sq. ft.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

B. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's

"Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

C. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

D. Roof-Edge Flashings: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone.

E. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches, except where pretinned surface would show in finished Work.

1. Do not solder the following metals:

    a. Aluminum.
    b. Coil-coated galvanized steel sheet.

2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

G. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.

1. Use joint adhesive for nonmoving joints specified not to be soldered.

H. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

I. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.
2. Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance.

J. Install reglets to receive counterflashing according to the following requirements:

1. Where reglets are shown in masonry, furnish reglets for installation under Division 4 Section "Unit Masonry."

K. Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of 2 inches and bed with sealant.

L. Roof Drainage System: Install drainage items fabricated from sheet metal, with straps, adhesives and anchors recommended by SMACNA's Manual or the manufacturer, to drain roof in the most efficient manner. Coordinate roof drain flashing installation with roof drainage system installation. Coordinate flashing and sheet metal items for steep-sloped roofs with roofing installation.

M. Overhead-Piping Safety Pans: Suspend pans from pipe and install drain line to plumbing waste or drain line.

N. Equipment Support Flashing: Coordinate equipment support flashing installation with roofing and equipment installation. Weld or seal flashing to equipment support member.

O. Roof Penetration Flashing: Coordinate roof penetration flashing installation with roofing and installation of items penetrating roof.

1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.

2. Seal and clamp flashing to pipes penetrating roof, other than lead flashing on vent piping.

3.3 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION 076200

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Floor hatches.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
2. Section 055213 "Pipe and Tube Railings" for safety railing systems not attached to roof-hatch curbs.
3. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.

1.3 COORDINATION

A. Coordinate layout and installation of roof accessories with interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof accessories.

1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

D. Delegated-Design Submittal: For roof curbs and equipment supports indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail mounting, securing, and flashing of roof-mounted items to roof structure. Indicate coordinating requirements with roof membrane system.
2. Wind-Restraint Details: Detail fabrication and attachment of wind restraints. Show anchorage details and indicate quantity, diameter, and depth of penetration of anchors.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:

1. Size and location of roof accessories specified in this Section.
2. Method of attaching roof accessories to roof or building structure.
3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
4. Required clearances.

B. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.7 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta units when tested according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design roof curbs and equipment supports to comply with wind performance requirements, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

2.2 ROOF HATCHES

A. Roof Hatches: Metal roof-hatch units with lids and insulated double walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.

B. Type and Size: Double-leaf lid, 36 by 40 inches

C. Loads: Minimum 40-lbf/sq. ft. external live load and 20-lbf/sq. ft

D. Hatch Material: Aluminum sheet.

1. Thickness: Manufacturer's standard thickness for hatch size indicated
2. Finish: Clear anodic

E. Construction:

1. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
3. Hatch Lid: Glazed, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
5. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
6. Fabricate curbs to minimum height of 12 inches (305 mm) above roofing/floor surface unless otherwise indicated.

F. Hardware: Spring operators, hold-open arm, galvanized steel spring latch with turn handles, galvanized steel butt- or pintle-type hinge system, and padlock hasps inside and outside.

1. Provide two-point latch on lids larger than 84 inches (2130 mm).
2. Provide remote-control operation.

G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.

1. Height: 42 inches above finished roof deck.
2. Posts and Rails: Galvanized-steel pipe, 1-1/4 inches (31 mm) in diameter or galvanized-steel tube, 1-5/8 inches (41 mm) in diameter.
3. Flat Bar: Galvanized steel, 2 inches (50 mm) high by 3/8 inch (9 mm) thick.
4. Maximum Opening Size: System constructed to prevent passage of a sphere 21 inches (533 mm) in diameter.
5. Chain Passway Barrier: Galvanized proof coil chain with quick link on fixed end.
6. Self-Latching Gate: Fabricated of same materials and rail spacing as safety railing system. Provide manufacturer's standard hinges and self-latching mechanism.
7. Post and Rail Tops and Ends: Weather resistant, closed or plugged with prefabricated end fittings.
8. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members.
9. Fabricate joints exposed to weather to be watertight.
10. Fasteners: Manufacturer's standard, finished to match railing system.
11. Finish: mill

H. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.

1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
2. Height: 42 inches above finished roof deck.
3. Material: Aluminum
4. Post: 1-5/8-inch- diameter pipe.
5. Finish: Manufacturer's standard baked enamel or powder coat - black

2.3 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

C. Verify dimensions of roof openings for roof accessories.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions.

1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.

C. Roof Curb Installation: Install each roof curb so top surface is level.

D. Equipment Support Installation: Install equipment supports so top surfaces are level with each other.

E. Roof-Hatch Installation:

1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.

2. Attach safety railing system to roof-hatch curb.
3. Attach ladder-assist post according to manufacturer's written instructions.

F. Heat and Smoke Vent Installation:

1. Install heat and smoke vent so top perimeter surfaces are level.
2. Install and test heat and smoke vents and their components for proper operation according to NFPA 204.

G. Gravity Ventilator Installation: Verify that gravity ventilators operate properly and have unrestricted airflow. Clean, lubricate, and adjust operating mechanisms.

H. Pipe Support Installation: Comply with MSS SP-58 and MSS SP-89. Install supports and attachments as required to properly support piping. Arrange for grouping of parallel runs of horizontal piping, and support together.

1. Pipes of Various Sizes: Space supports for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.

I. Security Grilles: Weld bar intersections and using tamper-resistant bolts, attach the ends of bars to structural frame or primary curb walls.

J. Roof Walkway Installation:

1. Verify that locations of access and servicing points for roof-mounted equipment are served by locations of roof walkways.
2. Remove ballast from top surface of low-slope roofing at locations of contact with roof-walkway supports.
3. Install roof walkway support pads prior to placement of roof walkway support stands onto low-slope roofing.
4. Redistribute removed ballast after installation of support pads.

3.3 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A780/A780M.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."

C. Clean exposed surfaces according to manufacturer's written instructions.

D. Clean off excess sealants.

E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes:

1. Exterior sealants.
2. Exterior and interior traffic sealants.
3. Interior sealants.
4. Metal lap joint sealants.
5. Threshold and sheet metal bedding sealants.
6. Joint accessories.

B. Related Sections include the following:

1. Division 7 Section "Sheet Metal Flashing & Trim" for building joint-sealant systems.
2. Division 7 Section "Metal Wall Panel" for building joint sealant systems.

1.3 SUBMITTALS

A. Shop Drawing:

1. Submit a Sealant Schedule, and related details, indicating specific installation and interface between sealants and building materials for each type of joint sealant and joint backing material used in this specification. Use SAME reference designations as indicated in this Specification for preparation of the Joint Sealant Schedule in Part 3.6. Submittals are subject to the requirements of Division 1 Specification Section "Submittals."

B. Product Data:

1. For each joint-sealant product indicated.

C. Samples:

1. Submit standard cured color samples and charts for each sealant type illustrating full range of standard and custom colors.

D. Manufacturer's Certificate:

1. Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
2. For manufacturer's products that include the phrase, "but are not limited to the following," the Contractor shall be responsible to provide certification that the submittal product complies with the specified product. This certification is subject to the requirements of Division 1 Specification Section "Submittals," Part 1, Definitions.

E. Qualifications Data:

1. For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified. Provide SWRI (Sealant, Waterproofing and Restoration Institute) Validation Certificate.

F. Compatibility and Adhesion from sealant manufacturer indicating the following:

1. Building materials forming joint and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
3. Preconstruction Compatibility and Adhesion Field Test for each sealant and building material.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. Submit recommended inspection intervals.
2. Submit instructions for repairing and replacing failed sealed joints.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project. Provide SWRI (Sealant, Waterproofing and Restoration Institute) Validation Certificate.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

D. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F.
3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience for the following sealant types:

1. Multi-component sealants cure by chemical reaction. Cure times are predictable depending on atmospheric temperature. Silicone sealant cure is not affected by temperature, however, frost and moisture at bond line will impair adhesion.
2. Single component sealants cure by reaction with moisture. Cure times will vary depending on atmospheric humidity and temperature.
3. Fast cure (FC) sealants provide lesser cure times than corresponding standard cure products. Longer cure times will permit more accumulation of dust and other air-borne contamination on surface of sealant, potentially causing apparent color change.
4. Sealant Types are M – Multi-Component and S – Single Component.
5. Sealant Grades are P – Pourable or Self-Leveling used for horizontal traffic joints and NS – Non-Sag or Gunnable used for vertical and non-traffic joints.
6. Sealant Classes are 25, 50, and 100/50 (extension/compression) representing movement capability in percent of joint width. Joint movement is based on the relative percentage of installed width. Design to a minimum of 4 times anticipated movement to accommodate design tolerances and expected movement based on coefficient of thermal expansion.
7. Sealant Uses are T – Traffic, NT – Non-Traffic, I – Immersion, M – Mortar, A – Aluminum, and O – Other. Use O includes color anodized aluminum, metals other than aluminum, painted surfaces, brick, stone, tile, and wood for example.
8. Immersion rated sealant applications require primer.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food; provide products that comply with 21 CFR 177.2600.

E. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range of standard and custom colors.

2.2 URETHANE SEALANT TYPES – For exterior or interior use.

A. **U1** - Multi-Component, Non-Sag, Urethane: ASTM C920, Type M, Grade NS, Class 50; Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Pecora Corporation; Dynatrol II.
2. Polymeric Systems, Inc.; PSI-270.
3. Tremco, Inc.; Dymeric 240 FC.

B. **U2** - Multi-Component, Traffic-Grade Urethane: ASTM C920, Type M, Grade NS, Class 50; Uses T, Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

1. Polymeric Systems, Inc.; PSI-270
2. Tremco, Inc.; Dymeric 240 FC.

C. **U3** - Single-Component, Non-Sag Urethane: ASTM C920, Type S, Grade NS, Class 100/50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Sika Corporation, Construction Products Division; Sikaflex-15LM.
2. Tremco, Inc.; Dymonic 100

D. **U4** - Single-Component, Non-Sag Urethane: ASTM C920, Type S, Grade NS, Class 25, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Pecora Corporation; Dynatrol I-XL.
2. Sika Corporation, Construction Products Division; Sikaflex-1a.
3. Tremco, Inc.; Dymonic or Fulkem 116.

E. **U5** - Single-Component, Pourable, Traffic-Grade Urethane: ASTM C920, Type S, Grade P, Class 25, Uses T. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Pecora Corporation; Urexpan NR-201.
2. Tremco, Inc; Vulkem 45SSL.
3. Sika Corporation, Construction Products Division; Sikaflex-1CSL.

F. **U6** - Immersible, Single Component, Pourable, Traffic-Grade Urethane: ASTM C 920, Type S, Grade P, Class 25, Uses T and I. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Sika Corporation, Construction Products Division; Sikaflex-1CSL.
2. Tremco, Inc.; Vulkem 45 SSL.

G. **U7** - Immersible, Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C920. Type M, Grade P, Class 25, for Use T and I. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. LymTal International, Inc.; Iso-Flex 880GB.
2. May National Associates, Inc.; Bondaflex PUR 2 SL.
3. Tremco, Inc.; Vulkem 245

2.3 SILICONE SEALANT TYPES – For exterior or interior use.

A. **S1** - Single-Component, Non-Staining, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to the following:

1. Dow Corning Corporation; 756SMS, 791, 795 or 995.
2. Tremco, Inc.; Spectrem 3.
3. Pecora Corporation; 864, 895 or 898.

B. **S2** - Single Component, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 100/50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Dow Corning Corporation; 790
2. Pecora Corporation; 301NS, 311NS.
3. Tremco, Inc.; Spectrem 1.

C. **S3** - Single Component, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Dow Corning Corporation; 791, 795 or 995.
2. Pecora Corporation; 864, 895 or 898.
3. Tremco, Inc.; Spectrem 2, Proglaze SSG.

D. **S-4** - Single Component, Field-Tintable, Non-Sag, Neutral-Curing Silicone: ASTM C920, Type S, Grade NS, Class 50, Uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Pecora Corporation; 890 FTS.
2. Tremco, Inc.; Spectrem 4TS.

E. **S5** - Mildew-resistant, Single Component, Acid-Curing Silicone: ASTM C920, Type S, Grade NS, Class 25, uses NT. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. BASF Building Systems; Omniplus
2. Dow Corning Corporation; 786 Mildew Resistant.
3. Tremco, Inc.; Tremsil 200 Sanitary.

2.4 LATEX SEALANT TYPES – For Interior Use Only

A. **L1** – Acrylic Latex or Siliconized Acrylic Latex, ASTM C834, Type OP, Grade NF. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. BASF Building Systems; Sonolac.
2. Pecora Corporation; AC-20+.
3. Tremco, Inc.; Tremflex 834.

B. **L2** - Acoustical Joint Sealant for Exposed and Concealed Joints: ASTM C1311 Manufacturer's standard Non-sag, paintable, no staining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Tremco, Inc.; Acoustical Sealant.
2. Pecora Corporation; AC-20 FTR, AIS-919.
3. USG Corporation; SHEETROCK Acoustical Sealant.

2.5 SOLVENT-RELEASE-CURING-JOINT SEALANTS:

A. **B1** - Butyl-Rubber-Based Joint Sealant: ASTM C 1311. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following.

1. Tremco, Inc.; Tremco Butyl Sealant.
2. Bostik, Inc.; Chem-Calk 300.
3. Pecora Corporation; BC-158.

2.6 PREFORMED JOINT SEALANTS – For exterior or interior applications per manufacturer's standards.

A. **PF1** - Preformed Silicone Joint Sealants: Manufacturer's standard sealant consisting of procured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Dow Corning Corporation; 123 Silicone Seal
2. Pecora Corporation; Sil-Span
3. Tremco, Inc.; Simple Seal.

B. **PF2** - Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu.ft. (160 kg/cu.m) and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping. Subject to compliance with

requirements, products that may be incorporated into the Work include, but are not limited to the following:

1. Tremco, Inc.; illbruk illmod 600.
2. EMSEAL Joint Systems, Ltd.; Emseal 25V.
3. School International, Inc.; Sealtite, Sealtite 50N.

2.7 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASATM C 1330, of type indicated below and size and density to control sealant depth and otherwise contribute to producing optimum sealant performance, paired to the sealant type. List the type on the Sealant Schedule.

1. **Type C**: Closed-cell material with a surface skin.
2. **Type O**: Open-cell material.

    a. Bostik, Inc.
    b. Pecora Corporation
    c. Tremco, Inc.

2.8 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant back materials, free of oil residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

2.9 EXISTING WORK

A. Mechanically remove existing sealant.

B. Clean joint surfaces of residual sealant and other contaminates capable of affecting sealant bond to joint surface.

C. Allow joint surfaces to dry before installing new sealants.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include, but are not limited to, the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.
    d. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include, but are not limited to, the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or

by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques to comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.

2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead ¼ inch (6 mm) inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

H. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

Sealant types should be selected from the available listed products in Part 2 of this specification section. These sealants shall be indicated on the submittal schedule, using the same reference designation as indicated in Part 1.3.A. of this specification section.

A. Exterior or Interior Sealant Joints

1. Applications:

    a. Control and expansion joints in cast-in-place concrete.
    b. Joints between [architectural] [structural] precast concrete units.
    c. Butt joints between metal panels.
    d. Joints between different materials listed above.
    e. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.

2. Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified

B. Interior Food Contact Sealant Joints.

1. Applications:

a. Joints in kitchen counter tops and work surfaces.
b. Joints between food service equipment and surrounding construction.
c. Other interior joints where incidental food contact may occur.

C. Metal Lap and Bedding Sealant Joints.

1. Applications:

a. Concealed lap and hook joints in sheet metal flashing and trim.
b. Bedding joints under metal thresholds and saddles.
c. Bedding joints between sheet metal flashing and other materials.

D. Preformed Joint Sealants:

1. Applications:

a. Control and expansion joints in cast-in-place concrete.
b. Butt joints between metal panels.
c. Joints between different materials listed above.
d. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.
e. Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified.

END OF SECTION 079200

SECTION 092550 GYPSUM BOARD ASSEMBLIES

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. Nonload-bearing steel framing members for gypsum board assemblies.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 6 Section "Rough Carpentry" for wood framing and furring.
2. Division 7 Section “Metal Wall Panels” for interior wall sheathing.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 ASSEMBLY PERFORMANCE REQUIREMENTS

A. Fire Resistance: Provide gypsum board assemblies with fire-resistance ratings indicated.

1.5 ACTION SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each type of product specified.

C. Product certificates signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.

1.6 QUALITY ASSURANCE

A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.

B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

D. Fire-Test-Response Characteristics: Where fire-resistance-rated gypsum board assemblies are indicated, provide gypsum board assemblies that comply with the following requirements:

1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.

1.8 PROJECT CONDITIONS

A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.

B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F. For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F for 48 hours before application and continuously after until dry. Do not exceed 95 deg F when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Steel Framing and Furring:

a. Dale Industries, Inc.
b. Dietrich Industries, Inc.
c. Marino/Ware (formerly Marino Industries Corp.).
d. National Gypsum Co.; Gold Bond Building Products Division.
e. Unimast, Inc.

2.2 STEEL FRAMING FOR WALLS AND PARTITIONS

A. General: Provide steel framing members complying with the following requirements:

1. Protective Coating: Manufacturer's standard corrosion-resistant coating.

B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

1. Thickness: 0.0312 inch, unless otherwise indicated
2. Depth: 3-5/8 inches, where indicated.
3. Depth: 6-inches where indicated.

C. Deflection Track: Manufacturer's standard top runner designed to prevent cracking of gypsum board applied to interior partitions resulting from deflection of the structure above fabricated from steel sheet complying with ASTM A 653 or ASTM A 568. Thickness as indicated for studs, and width to accommodated depth of studs, and of the following configuration:

1. Top runner with 2-1/2-inch- deep flanges that either have V-shaped offsets that compress when pressure is applied from construction above or have slots 1 inch o.c. that allow fasteners attached to studs through the slots to accommodate structural movement by slipping.

a. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

a. Superior Flex Track System (SFT); Delta Star, Inc.
b. SLP-TRK; Metal-Lite, Inc.

D. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth and minimum thickness of base (uncoated) metal as follows:

1. Thickness: 0.0179 inch, unless otherwise indicated.
2. Depth: 7/8 inch.

E. Furring Brackets: Serrated-arm type, adjustable, fabricated from corrosion-resistant steel sheet complying with ASTM C 645, minimum thickness of base (uncoated) metal of 0.0329 inch, designed for screw attachment to steel studs and steel rigid furring channels used for furring.

F. Steel Resilient Furring Channels: Manufacturer's standard product designed to reduce sound transmission, fabricated from steel sheet complying with ASTM A 653 or ASTM A 568 to form 1/2-inch- deep channel of the following configuration:

1. Single- or Double-Leg Configuration: Asymmetric-shaped channel with face connected to a single flange by a single-slotted leg (web) or hat-shaped channel,

with 1-1/2-inch- wide face connected to flanges by double-slotted or expanded-metal legs (webs).

G. Steel Channel Bridging: Cold-rolled steel, 0.0598-inch minimum thickness of base (uncoated) metal and 7/16-inch- wide flanges, 1-1/2 inches deep, 475 lb/1000 feet, unless otherwise indicated.

H. Steel Flat Strap and Backing Plate: Steel sheet for blocking and bracing complying with ASTM A 653 or ASTM A 568, length and width as indicated, and with a minimum base metal (uncoated) thickness as follows:

1. Thickness: 0.0598 inch unless indicated otherwise.

I. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.

C. Steel drill screws complying with ASTM C 1002 for the following applications:

1. Fastening gypsum board to steel members less than 0.033 inch thick.

D. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch thick.

E. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Ceiling Anchorages: Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.

3.3 INSTALLING STEEL FRAMING, GENERAL

A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.

B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with United States Gypsum Co.'s "Gypsum Construction Handbook."

1. Use steel flat strap and backing plate as blocking and bracing for the support of above listed items.

C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement. Comply with details shown on Drawings.

1. Where building structure abuts ceiling perimeter or penetrates ceiling.
2. Where partition framing and wall furring abut structure, except at floor.

a. Install deflection track top runner to attain lateral support and avoid axial loading.
b. Install deflection and firestop track top runner at fire-resistance-rated assemblies.

a. Attach jamb studs at openings to tracks using manufacturer's standard stud clip.

D. Do not bridge building control and expansion joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.

3.4 INSTALLING STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

A. Suspend ceiling hangers from building structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard

suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.
4. Secure flat, angle, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for structure as well as for type of hanger involved, and in a manner that will not cause them to deteriorate or otherwise fail.
5. Do not attach hangers to steel deck tabs.
6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
7. Do not connect or suspend steel framing from ducts, pipes, or conduit.

B. Sway-brace suspended steel framing with hangers used for support.

C. Install suspended steel framing components in sizes and at spacings indicated, but not less than that required by the referenced steel framing installation standard.

1. Wire Hangers: 48 inches o.c.
2. Carrying Channels (Main Runners): 48 inches o.c.
3. Furring Channels (Furring Members): 16 inches o.c.

D. Installation Tolerances: Install steel framing components for suspended ceilings so that cross-furring or grid suspension members are level to within 1/8 inch in 12 feet as measured both lengthwise on each member and transversely between parallel members.

E. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

F. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

3.5 INSTALLING STEEL FRAMING FOR WALLS AND PARTITIONS

A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.

1. Where studs are installed directly against exterior walls, install asphalt felt strips or foam gaskets between studs and wall.

B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8 inch from the plane formed by the faces of adjacent framing.

C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at, or within 12 inches above, suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.

1. Cut studs short of full height in accordance with deflection track manufacturer's installation instructions to provide perimeter relief.
2. For STC-rated and fire-resistance-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.

D. Terminate partition framing at, or within 12 inches above, suspended ceilings where indicated.

E. Install steel studs and furring in sizes and at spacings indicated.

1. Single-Layer Construction: Space studs and furring 16 inches o.c., unless otherwise indicated.

F. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.

G. Frame door openings to comply with GA-219, and with applicable published recommendations of gypsum board manufacturer, unless otherwise indicated. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

1. Install 2 studs at each jamb, unless otherwise indicated.
2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint.
3. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above.

H. Frame openings other than door openings to comply with details indicated or, if none indicated, as required for door openings. Install framing below sills of openings to match framing required above door heads.

3.6 FIELD QUALITY CONTROL

A. Above-Ceiling Observation: Architect will conduct an above-ceiling observation prior to installation of gypsum board ceilings and report any deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.

1. Notify Architect one week in advance of the date and the time when the Project, or part of the Project, will be ready for an above-ceiling observation.

3.7 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 092550

SECTION 099123 – PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will supply a color selection.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Metal wall panels.
b. Metal fascia and trim.
c. Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Foundation spaces.
b. Furred areas.
c. Ceiling plenums.

3. Finished metal surfaces include the following:

a. Anodized aluminum.
b. Stainless steel.
c. Chromium plate.
d. Copper and copper alloys.
e. Bronze and brass.

4. Operating parts include moving parts of operating equipment and the following:

a. Valve and damper operators.
b. Linkages.
c. Sensing devices.
d. Motor and fan shafts.

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections include the following:

1. Division 5 Sections for shop priming of metal substrates with primers specified in this Section.
2. Division 5 Section "Structural Steel" for shop priming structural steel.
3. Division 5 Section "Metal Fabrications" for shop priming ferrous metal.
4. Division 8 Section "Steel Doors and Frames" for factory priming steel doors and frames.

1.3 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

A. Product Data: For each paint system indicated. Include block fillers and primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification. Submit in same format as specification.
2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC's).

B. Colors: Match Architect's color selections.

C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Submit 4 sets of samples of each final color and finish.

D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to be demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Certifications:

1. Furnish a letter from the paint manufacturer or their factory representative certifying that the paint system proposed for this project are equal to or better than the specified systems in appearance and performance levels. Submit proof of equivalency for approval including generic type, descriptive information, VOC content, performance data, solids by volume, and recommended film thickness. Submittals not accompanied by this certification will be returned, "REJECTED."

F. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

C. 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. Duplicate finish of approved sample Submittals.

1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.

a. Provide mock up of first and second coats of block filler or primer for approval of application.
b. Wall Surfaces: Provide samples on at least 100 sq. ft.
c. Small Areas and Items: Architect will designate items or areas required.

D. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface. Where materials are being applied over previously painted surfaces, apply mock up samples and perform field testing to check for compatibility, adhesion, and film integrity of the new materials to existing painted surfaces. Report in writing any condition that may affect application, appearance, or performance of the specified coating system.

1. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.
2. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. 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.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

C. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.7 PROJECT CONDITIONS

A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.

B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.

C. 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. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.8 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 left-over paint materials to Owner.

1. Quantity: Furnish Owner with extra paint materials in quantities indicated below:

    a. Exterior: 1 gallon of each color applied.
    b. Interior: 1 gallon of each color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, provide products from one of the following manufacturers. Sherwin-Williams is the basis of design and establishes the standard of quality required.

B. Manufacturers' Names:

1. Sherwin Williams (SW).
2. Duron.
3. PPG.
4. MAB.
5. Glidden.

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, 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. Each system should be from the same manufacturer.

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.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: Match Architect's samples.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

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.

1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

C. Where materials are being applied over previously painted surfaces, apply mock up samples and perform field testing to check for compatibility, adhesion, and film integrity of the new materials to existing painted surfaces. Report in writing any condition that may affect application, appearance, or performance of the specified coating system.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. 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.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning. All surfaces must be clean, dry, and free of all oil, grease, surface contaminants, and substances that could impair adhesion.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

2. All previously coated surfaces shall clean, dry, dull, and in sound condition prior to coating. All loose paints (either visible or not) shall be removed to expose a sound surface for repainting. All smooth, glossy surfaces shall be abraded to impart a surface profile that will promote adhesion of the subsequent coating system. A test-patch shall be applied prior to a full installation to assure adequate adhesion will be achieved.

C. 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. Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
c. If transparent finish is required, back-prime with spar varnish.
d. Back-prime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

4. 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. Power Tool Clean steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 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.

5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
6. Interior Grilles, Louvers and Sprinkler Escutcheons shall be painted in the field to match adjacent material color. Contractor shall prep and prime factory finished items to receive new paint finish in the field.

D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

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.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. The term "exposed surfaces" includes 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.
5. 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.
6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
10. Sand lightly between each succeeding enamel or varnish coat.

B. 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. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer over metal surfaces that have been shop primed and touchup painted.
3. 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. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Exposed uninsulated metal piping.
2. Exposed uninsulated plastic piping.
3. Exposed pipe hangers and supports.
4. Tanks that do not have factory-applied final finishes.
5. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

G. Electrical items to be painted include, but are not limited to, the following:

1. Switchgear.
2. Panel boards.
3. Electrical equipment that is indicated to have a factory-primed finish for field painting.

H. All interior and exterior exposed gypsum wallboard, including any bulkheads and soffits to be painted.

I. All interior and exterior ferrous metal to be painted including any lintels, railings, grilles, and louvers (does not include factory or pre-finished items).

J. All hollow metal and metal doors and frames, interior and exterior, to be painted.

K. 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.

L. 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.

M. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

N. Marking and Identification: Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

1. Be located in accessible concealed floor, floor-ceiling or attic spaces;
2. Be repeated at intervals not exceeding 30 feet measured horizontally along the wall or partition; and
3. Include lettering not less than 0.5 inch in height, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER-PROTECT ALL OPENINGS," or other wording.

    a. Exception: Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

3.4 FIELD QUALITY CONTROL

A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:

1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
2. Testing agency will perform appropriate tests for the following characteristics as required by Owner:

    a. Quantitative material analysis.
    b. Abrasion resistance.
    c. Apparent reflectivity.
    d. Flexibility.
    e. Washability.
    f. Absorption.
    g. Accelerated weathering.
    h. Dry opacity.
    i. Accelerated yellowness.
    j. Recoating.
    k. Skinning.
    l. Color retention.
    m. Alkali and mildew resistance.

3. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

B. Pre-installation Meetings:

1. Schedule a conference and inspection to be held on-site before field application of coating systems begins.
2. Conference shall be attended by Contractor, Owner's representative, Engineer, Construction Manager, coating applicators, and a representative of coating material manufacturer.
3. Topics to be discussed at meeting shall include:
    a. A review of Contract Documents and accepted shop drawings shall be made and deviations or differences shall be resolved.
    b. Review items such as environmental conditions, surface conditions, surface preparation, application procedures, and protection following application.
    c. Establish which areas on-site will be available for use as storage areas and working area
4. Pre-construction conference and inspection shall serve to clarify Contract Documents, application requirements and what work should be completed before coating application can begin.
5. Prepare and submit, to parties in attendance, a written report of pre-installation conference report shall be submitted with 3 days following conference.
6. Field Samples:
    a. Provide a full coating system to the required sheen, color, texture, and recommended coverage rates. Simulate finished lighting conditions for reviewing in-place work.
7. The Architect, Construction Manager or Owners Representative will select one room, area, or combination of areas and surfaces and conditions for each type of coating and substrate to be coated. Apply coatings in this room, area, combination of areas and surfaces according to the schedule, or as specified. After finishes are accepted, this room, area or combination of areas and surfaces will serve as the standard of quality and for evaluation of coating systems of similar nature.
8. A manufacturer’s representative shall be available upon request by the General Contractor or Painting subcontractor, to advise applicator on proper application technique and procedures.

3.5 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
    1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

A. 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.

B. 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.

3.7 EXTERIOR PAINT SCHEDULE

A. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.

1. Semi-Gloss Acrylic-Enamel Finish: two finish coats over a rust-inhibitive primer.

a. Primer: Pro Industrial Pro-Cryl Universal Metal Primer, B66-310 series
b. 1st Coat: SW Waterbased Acrolyn 100 Waterbased Urethane Gloss.
c. 2nd Coat: SW Waterbased Acrolyn 100 Waterbased Urethane Gloss.

B. Previously Painted Ferrous Metal: Provide the following finish systems over exterior previously painted ferrous metal. Primer is not required on shop-primed items. *Note: Mock-Up with adhesion test per ASTM-D3359 is required prior to installation of this system.

1. Semi-Gloss Acrylic-Enamel Finish: two finish coats over an adhesion promoting primer.

a. Spot Primer (for bare or rusted areas): Pro Industrial Pro-Cryl Universal Metal Primer, B66-310 series.
b. Primer: Primer: Extreme Bond Interior/Exterior Bonding Primer, B51-150.
c. 1st Coat: SW Waterbased Acrolyn 100 Waterbased Urethane Gloss.
d. 2nd Coat: SW Waterbased Acrolyn 100 Waterbased Urethane Gloss.

3.8 INTERIOR PAINT SCHEDULE

A. Ferrous Metal: Provide the following finish systems over ferrous metal:

1. Semi-Gloss Finish: two finish coats over a primer.

a. Primer: Pro Industrial Pro-Cryl Universal Metal Primer, B66-310 series
b. 1st Coat: Pro Industrial Waterbased Catalyzed Epoxy Gloss.
c. 2nd Coat: Pro Industrial Waterbased Catalyzed Epoxy Gloss.

B. Galvanized Metal: Provide the following finish systems over galvanized metal:

1. Semi-Gloss Finish: two finish coats over a primer.

a. Primer: Pro Industrial Pro-Cryl Universal Metal Primer, B66-310 series
b. 1st Coat: SW Pro Industrial Waterbased Catalyzed Epoxy Gloss.
c. 2nd Coat: Pro Industrial Waterbased Catalyzed Epoxy Gloss.

C. Dry Fog Paint: Provide where indicated for painted exposed structure.

1. Provide dry fog paint system according to approved manufacture's recommendations.

a. Primer: Pro Industrial Pro-Cryl Universal Metal Primer, B66-310 series
*Omit primer on clean galvanized surfaces

b. 1st Coat: Pro Industrial Waterborne Acrylic Dryfall Flat, B42W81 series
c. 2nd Coat: Pro Industrial Waterborne Acrylic Dryfall Flat, B42W81 series

END OF SECTION 099123

SECTION 131440 FIRE TRAINING SIMULATOR EQUIPMENT

PART 1– GENERAL

1.1 Work Included

A. The work under this section shall include the furnishing of all items shown as specified including:

1. Anchors, supports, and other accessories.

2. Steel closures, doors, door hardware, and hollow metal door frames.

3. Burn room insulating system.

1.2 Related Sections

A. Division 3 – Supply and setting of anchor bolts

B. Division 3 – Concrete slabs and fill on elevated slabs

C. Division 5 – Metal fabrications

1.3 Definition

A. This simulator shall be used to provide training for firefighters in a controlled simulated environment, which is commensurate with actual fire conditions. These specifications shall be used in conjunction with the drawings for dimensions, features, and exact configuration of the training structure.

1.4 References

A. National Fire Protection Association (NFPA)

1. NFPA 1402 – Guide to Building Fire Training Centers

2. NFPA 1403 – Standard on Live Fire Training Evolutions

B. American Society for Testing and Materials (ASTM)

C. AWS D1.1 – Structural Welding Code – Steel

D. American Institute of Steel Construction (AISC), Manual of Steel Construction, latest edition

E. Occupational Safety and Health Standards (OSHA)

1. 29 CFR 1910.23 – Guarding Wall and Floor Openings

2. 29 CFR 1910.24 – Fixed Industrial Stairs

3. 29 CFR 1910.27 – Fixed Ladders

F. Steel Deck Institute (SDI), SDI 30 - Design Manual for Composite Decks, Form Decks, Roof Decks; Steel Deck Institute, Inc.

1.5 Design Requirements

A. Code Requirements

1. shall comply with the Virginia Building Code 2015 edition.

2. Safety design shall comply with applicable OSHA requirements.

3. Training shall comply with applicable NFPA 1403 requirements.

4. Due to the nature of the intended use, egress and fire code requirements are not expected to satisfy the code criteria for buildings intended to accommodate public occupancy.

a. Local codes may require the simulator to have a variance due to the intended use and features unique to its application.

b. It is the responsibility of the owner or owner's representative to determine the proper procedures and variances for their location and obtain the necessary variances or requirements.

1.6 Submittals

A. Burn Room Liner (Heat Resistant Panel System)

1. Submit [3] sets of cut sheet information on the burn room liner.

2. Submit [3] sets of MSDS reports on all applicable materials to be used as burn room liner.

3. Submit [3] 3"x3" samples of burn room liner material.

4. Submit [3] sets of burn room layout drawings including ceiling layouts, wall layouts, and any necessary details.

B. Miscellaneous Submittals

1. Submit [3] sets of cut sheet information on all applicable additional materials including rappelling anchors, shutter slam latches and handles, doors, windows, color charts, and any other materials included as options.

1.7 Quality Assurance

A. Supplier shall have a minimum of 5 years experience in the design, engineering, and fabrication of fire training products.

1.8 Delivery, Storage, and Handling

A. Store all building components according to building storage instructions above ground, separated, and protected from exposure to the elements & from physical damage caused by other activities.

B. During storage, space surfaces of materials to permit free circulation of air.

C. 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.

1.9 Warranty

A. Supplier shall provide a one (1) year warranty from the date of Substantial Completion warranting all components to be free from defects in materials and workmanship under normal use and service.

B. Supplier shall provide a twenty (20) year warranty from the date of Substantial Completion warranting the thermal liner panels to be free from defects in materials and workmanship under normal use and service.

PART 2– PRODUCTS

2.1 Suppliers

A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following.

1. Basis of Design: WHP Trainingtowers; 9130 Flint, Overland Park, KS 66214. TEL: (800) 351-2525 or (913) 385-3663. FAX: (913) 385-7078. Email:info@trainingtowers.com Website:www.trainingtowers.com

2.2 Materials

1. Conform to applicable ASTM specifications.

2. Galvanize all structural and non-structural materials used, less than ¼" in thickness, whether or not exposed to the elements.

2.3 Fasteners

A. Provide pre-drilled/pre-punched holes for bolted attachment of material during erection.

B. Field bolt wall panel system with $^{3}/_{8}$" electro-galvanized, powder coated bolts at 6" on center.

C. Furnish wall panel system fasteners with a nylon washer to complete the weather-tight seal.

D. Provide fasteners of sufficient strength to support connected members and loads, and to develop full strength of parts fastened or connected.

E. Anchor bolts shall meet the diameter specified on the anchor bolt plan.

1. Anchor bolts are not included in this section.

2.4 Shop Finish Painting/Coating

A. Clean, prepare surfaces and shop prime structural steel except where members are zinc or aluminum-zinc alloy coated, or are to be incased in concrete.

B. Paint system for all window shutters, headers, jambs, and sills exposed to the exterior. Factory applied silicone modified polyester or electrostatic-applied polyester powder coating in accordance with manufacturer's standard procedures. Minimum dry film thickness 1.0 mils. Color to be selected from manufacturer's full range colors.

C. Paint system for all protective wear plates exposed to the exterior. Factory applied silicone modified polyester or electrostatic-applied polyester powder coating in accordance with manufacturer's standard procedures. Minimum dry film thickness 1.0 mils. Color to be selected from manufacturer's full range colors.

D. Paint system for all doors and door frames. Factory applied aliphatic urethane in accordance with manufacturer's standard procedures. Minimum dry film thickness 2.0 mils. Color to be selected from manufacturer's full range colors.

E. Factory finish for roof hatches. Roof hatches shall be provided with manufacturer's standard factory-applied grey powder coat.

F. Factory treatment of burn room liner. Burn room liner shall be pre-treated with a two (2) part chemical system to be water resistant/repellent.

2.5 Fire Fighting Simulator Components

A. Access Openings

1. Steel Doors

a. Materials

1) Sheet face is to be made of commercial quality 11 gauge steel.

2) Reinforce top, bottom and sides of all doors with continuous steel channel not less than 3/16" thick, extending the full perimeter of the door and stitch welded to the face sheet.

b. Door Hardware

1) All non-burn room doors shall have an operating lever latch with handles on the inside and outside of the door. All doors accessible from the ground shall have a key lock lever and shall be keyed alike.

2) All burn room doors shall have 1" of Padgenite material shall have spring closures and magnetic catches to bring the door into the closed position. All doors accessible from the ground shall have a slide bolt lockable in both the locked and unlocked position.

3) Continuous hinge shall be 11 gauge with a 3/8" diameter pin and be stitch welded to the door face and bolted to the jamb 6" on center.

4) Each framed opening shall be provided with drip lip header.

5) Locksets conform to ANSI A156.2 Series 4000, Grade 2

   a) All locksets shall be keyed alike.

6) Passage latches conform to ANSI A156.2 Series 4000, Grade 2

7) Strikes conform to ANSI A156.2

8) 4½" door pulls conform to ANSI A156.2

9) Auxiliary Springs conform to ANSI K87454

10) High-temperature door sweep supplied on all doors except control room doors and elevator shaft doors, if any, that do not rest on a stem wall.

2. Window Shutters

   a. Materials

      1) Sheet face is to be made of commercial quality 12 gauge steel.

      2) Reinforce top, bottom and sides of all doors with continuous steel channel not less than 3/16" thick, extending the full perimeter of the door and stitch welded to the face sheet.

   b. Window Hardware

      1) All non-burn room windows shall have an operating lever latch with handles on the inside and outside of the door. All windows accessible from the ground shall have a key lock lever and shall be keyed alike.

      2) All burn room windows shall have 1" of Padgenite material shall have spring closures and magnetic catches to bring the window into the closed position. All windows accessible from the ground shall have a slide bolt lockable in both the locked and unlocked position.

3) Continuous hinge shall be 11 gauge with a 3/8” diameter pin and be stitch welded to the door face and bolted to the jamb 6” on center.

4) Each framed opening shall be provided with drip lip header.

5) Locksets conform to ANSI A156.2 Series 4000, Grade 2

   a) All locksets shall be keyed alike.

6) Passage latches conform to ANSI A156.2 Series 4000, Grade 2

7) Strikes conform to ANSI A156.2

8) 4½” door pulls conform to ANSI A156.2

9) Auxiliary Springs conform to ANSI K87454

B. High Temperature Insulated Fire Panels (Burn Room Lining System)

1. High temperature insulating panels and attachment materials shall be provided for the interior walls, ceiling, doors, and windows of ALL burn rooms And where detailed.

2. Panels in burn rooms shall be supported by a system of 18-gauge galvanized mounting channels mounted both horizontally and vertically and fastened to the building steel wall verticals using proper Tek screws. The horizontal mounting channels shall be 48” center-to-center and the vertical mounting channels shall be 24 inches center-to-center. Mounting channels shall be a nominal 6” in width and 1¼” in depth.

3. Panels shall be pre-cut to size and shall be 1" thick. Panels shall be pre-treated with a two part chemical system to be water resistant/repellent. Panels shall allow for live fires in temperature ranges of 1200 to 2000 degree F maximum depending on type of panel specified. Seams and joints shall be backed with 1” thick battens of similar material. Panels shall be fastened by 3” Tek screws with ¼” x 1 ¼” washers through oversized $^{5}/_{16}$”diameter field drilled holes, six per 2’ x 4’ panel. Use of “speed clips,” insulating clips or building insulation washers is prohibited. Panels shall be installed with a ½” gap between panels and the panel perimeter shall be screwed to the channels. Fasteners shall be left with the washers being able to be turned with moderate pressure on the board.

4. Super Padgenite HD insulating panels and accessories shall be capable of protecting the wall and ceiling surfaces of masonry, concrete or steel room, inclusive of windows, closures and doors from damage due to enclosed fires. Insulating materials shall be a minimum of: 1" thick, 75 PCF density, 3000 psi flex strength, possess a “K” factor of 1.92 or less at a mean temperature of 800° F., and be capable of continuous service at temperature ranges to 2000° F. The insulating panel shall be heat treated with the final treatment stage being at 1800° F. System shall withstand repeated exposure to heat and the application of water to heated surfaces without the breakdown of insulating properties. Insulating materials shall not require “drying out’ periods following the application of water nor be subject to “spalling” due to heat/moisture conditions. There shall be no restrictions imposed upon the nature of the Class A fuel source, the fire

location within neither the room nor any requirement of “special” precautions prior to ignition. A full set of installation drawings shall be prepared by the panel supplier and submitted for approval, which clearly shows the panel layout, sub-framing system and attachment layout. Materials proposed as equal to the “Super Padgenite HD” panels shall be approved seven (7) days prior to bid due date. The contractor shall provide a sample of the material, written specifications, engineered drawings showing a typical installation with hardware and sub-framing system clearly shown, and a MSDS.

5. Complete layout drawings shall show all elevations, views, and details the location of the mounting channels, battens, and cut pieces of panels.

C. Rappelling Anchors

1. Heavy duty forged with swivel eye.

2. 5,000 pound minimum capacity.

3. Galvanized steel

PART 3– EXECUTION

3.1 Examination

A. Verify that concrete work has cured a minimum of 14 days. Verify that anchor bolts are at the proper spacing and protrude the proper amount above the concrete. Report any variances to the owner’s representative prior to proceeding with erection.

1. Concrete stem wall elevation must be within tolerance of +/- ¼”.

2. Anchor bolts placement must be within tolerance of +/- $^{1}/_{8}$”.

3.2 Installation

A. Comply with the respective manufacturer’s recommendations for preparation of building components.

B. Comply with respective manufacturer’s instructions and approved shop drawings.

3.3 Adjusting and Cleaning

A. Repair or replace damaged components.

B. Contractor shall properly maintain the site, collect all waste material, place all debris and waste in containers and remove from the site.

END OF SECTION 131440