# PROJECT MANUAL

AIKIDO STUDIO

Spotsylvania, Virginia

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

THE OWNER:
(Name and address):
%

THE ARCHITECT:
(Name and address):
%

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ARTICLE 1  GENERAL PROVISIONS
§ 1.1 BASIC DEFINITIONS
§ 1.1.1 THE CONTRACT DOCUMENTS
The Contract Documents consist of the Agreement between Owner and Contractor (hereinafter 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 other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of Addenda relating to bidding requirements).

§ 1.1.2 THE CONTRACT
The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the Owner and a Subcontractor or Sub-subcontractor, (3) between the Owner and Architect or (4) between any persons or entities other than the Owner and 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 or 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 THE PROJECT MANUAL
The Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

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

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

§ 1.2.3 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.
§ 1.3 CAPITALIZATION
§ 1.3.1 Terms capitalized in these General Conditions include those which 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
§ 1.4.1 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 EXECUTION OF CONTRACT DOCUMENTS
§ 1.5.1 The Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request.

§ 1.5.2 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.

§ 1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
§ 1.6.1 The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect or the Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors of them and will retain all common law, statutory and other reserved rights, in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' copyrights or other reserved rights.

ARTICLE 2 OWNER
§ 2.1 GENERAL
§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

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

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 The Owner shall, at the written request of the Contractor, prior to commencement of the Work and thereafter, furnish to the Contractor reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Furnishing of such evidence shall be a condition precedent to commencement of
continuation of the Work. After such evidence has been furnished, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

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

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

§ 2.2.4 Information or services required of the Owner by the Contract Documents shall be furnished by the Owner with reasonable promptness. Any other information or services relevant to the Contractor's performance of the Work under the Owner's control shall be furnished by the Owner after receipt from the Contractor of a written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, such copies of Drawings and Project Manuals as are reasonably necessary for execution of the Work.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

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

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

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

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.

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

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

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the
Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies or omissions discovered by the Contractor shall be reported promptly to the Architect as a request for information in such form as the Architect may require.

§ 3.2.2 Any design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect, but 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. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but any nonconformity discovered by or made known to the Contractor shall be reported promptly to the Architect.

§ 3.2.3 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect in response to the Contractor's notices or requests for information pursuant to Sections 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Sections 4.3.6 and 4.3.7. If the Contractor fails to perform the obligations of Sections 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents or for differences between field measurements or conditions and the Contract Documents unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

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

§ 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 The Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not 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 otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

§ 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor which 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 AND NOTICES

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded.

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

§ 3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

§ 3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Architect and Owner, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 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;

.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 in sufficient time to avoid delay in the Work.

§ 3.9 SUPERINTENDENT

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

§ 3.10 CONTRACTOR’S CONSTRUCTION SCHEDULES

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

§ 3.10.2 The Contractor shall prepare and keep current, for the Architect’s approval, a schedule of submittals which is coordinated with the Contractor’s construction schedule and allows the Architect reasonable time to review 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

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

§ 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 which 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. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. 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 which 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 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. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

§ 3.12.6 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.
§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

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

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

§ 3.13 USE OF SITE
§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits 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.

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

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

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.
§ 3.16 ACCESS TO WORK
The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

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

§ 3.18 INDEMNIFICATION
To the fullest extent permitted by law and to the extent claims, damages, losses or expenses are not covered by Project Management Protective Liability insurance purchased by the Contractor in accordance with Section 11.3, 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 which would otherwise exist as to a party or person described in this Section 3.18.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT
§ 4.1 ARCHITECT
The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.

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

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

§ 4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT
The Architect will provide administration of the Contract as described in the Contract Documents, and will be an Owner's representative (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Section 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

§ 4.2.2 The Architect, as a representative of the Owner, will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and
requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

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

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

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

§ 4.2.7 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion, will 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, and will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.
§ 4.2.11 The Architect will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until 15 days after written request is made for them.

§ 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 initial 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 so 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.

§ 4.3 CLAIMS AND DISPUTES

§ 4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of 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. Claims must be initiated by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 4.3.2 Time Limits on Claims. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be initiated by written notice to the Architect and the other party.

§ 4.3.3 Continuing Contract Performance. Pending final resolution of a Claim except as otherwise agreed in writing or as provided in Section 9.7.1 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.

§ 4.3.4 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within 21 days after the Architect has given notice of the decision. If the conditions encountered are materially different, the Contract Sum and Contract Time shall be equitably adjusted, but if the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Section 4.4.

§ 4.3.5 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.6.

§ 4.3.6 If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with this Section 4.3.
§ 4.3.7 Claims for Additional Time

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

§ 4.3.7.2 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.

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

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

§ 4.3.10 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 4.3.10 shall be deemed to preclude an award of liquidated direct damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 4.4 RESOLUTION OF CLAIMS AND DISPUTES

§ 4.4.1 Decision of Architect. Claims, including those alleging an error or omission by the Architect but excluding those arising under Sections 10.3 through 10.5, shall be referred initially to the Architect for decision. An initial decision by the Architect shall be required as a condition precedent to mediation, arbitration or litigation of all Claims between the Contractor and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered by the Architect. The Architect will not decide disputes between the Contractor and persons or entities other than the Owner.

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

§ 4.4.3 In evaluating Claims, the Architect 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 Architect in rendering a decision. The Architect may request the Owner to authorize retention of such persons at the Owner's expense.

§ 4.4.4 If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either provide a response on the requested supporting data, advise the Architect when the response or supporting data will be furnished or advise the Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Architect will either reject or approve the Claim in whole or in part.
§ 4.4.5 The Architect will approve or reject Claims by written decision, which shall state the reasons therefor and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be final and binding on the parties but subject to mediation and arbitration.

§ 4.4.6 When a written decision of the Architect states that (1) the decision is final but subject to mediation and arbitration and (2) a demand for arbitration of a Claim covered by such decision must be made within 30 days after the date on which the party making the demand receives the final written decision, then failure to demand arbitration within said 30 days' period shall result in the Architect's decision becoming final and binding upon the Owner and Contractor. If the Architect renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence, but shall not supersede arbitration proceedings unless the decision is acceptable to all parties concerned.

§ 4.4.7 Upon receipt of a Claim against the Contractor or at any time thereafter, the Architect or 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 Architect or the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 4.4.8 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 prior to resolution of the Claim by the Architect, by mediation or by arbitration.

§ 4.5 MEDIATION

§ 4.5.1 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Sections 4.3.10, 9.10.4 and 9.10.5 shall, after initial decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to mediation as a condition precedent to arbitration or the institution of legal or equitable proceedings by either party.

§ 4.5.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect. Request for mediation shall be filed in writing with the other party to the Contract and with the American Arbitration Association. The request may be made concurrently with the filing of a demand for arbitration but, in such event, mediation shall proceed in advance of arbitration or legal or equitable 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.

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

§ 4.6 ARBITRATION

§ 4.6.1 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Sections 4.3.10, 9.10.4 and 9.10.5, shall, after decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to arbitration. Prior to arbitration, the parties shall endeavor to resolve disputes by mediation in accordance with the provisions of Section 4.5.

§ 4.6.2 Claims not resolved by mediation shall be decided by arbitration which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect. The demand for arbitration shall be filed in writing with the other party to the Contract and with the American Arbitration Association, and a copy shall be filed with the Architect.

§ 4.6.3 A demand for arbitration shall be made within the time limits specified in Sections 4.4.6 and 4.6.1 as applicable, and in other cases within a reasonable time after the Claim has arisen, and no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations as determined pursuant to Section 13.7.
§ 4.6.4 Limitation on Consolidation or Joinder. No arbitration arising out of or relating to the Contract shall include, by consolidation or joinder or in any other manner, the Architect, the Architect's employees or consultants, except by written consent containing specific reference to the Agreement and signed by the Architect, Owner, Contractor and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the Owner, Contractor, a separate contractor as described in Article 6 and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the Owner, Contractor or a separate contractor as described in Article 6 shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a Claim not described therein or with a person or entity not named or described therein. 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.

§ 4.6.5 Claims and Timely Assertion of Claims. 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.

§ 4.6.6 Judgment on Final Award. 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.

ARTICLE 5 SUBCONTRACTORS
§ 5.1 DEFINITIONS
§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

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

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK
§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner or Architect, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Architect to reply promptly 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 change a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitute.
§ 5.3 SUBCONTRACTUAL RELATIONS

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

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

§ 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.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Section 4.3.

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

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

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

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall cooperate with the Contractor's construction and operations with theirs as required by the Contract Documents.
§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.

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

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

§ 6.3 OWNER'S RIGHT TO CLEAN UP
§ 6.3.1 If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

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

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

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

§ 7.2 CHANGE ORDERS
§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect, stating their agreement upon all of the following:
  1. 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.

§ 7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Section 7.3.3.

§ 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 7.3.6.

§ 7.3.4 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.

§ 7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor 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.

§ 7.3.6 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Architect 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, a reasonable allowance for overhead and profit. 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 7.3.6 shall be limited to the following:

1. costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
2. costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
3. rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
4. costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
5. additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.7 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which 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.

§ 7.3.8 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Architect will make an interim determination for purposes of monthly certification for payment for those costs. That 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 4.

§ 7.3.9 When the Owner and Contractor agree with the 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 shall be recorded by preparation and execution of an appropriate Change Order.

§ 7.4 MINOR CHANGES IN THE WORK

§ 7.4.1 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.
ARTICLE 8 TIME
§ 8.1 DEFINITIONS
§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

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

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

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

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by the Contract Documents or a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

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

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

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Section 4.3.

§ 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.

§ 9.2 SCHEDULE OF VALUES
§ 9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

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

§ 9.3.1.1 As provided in Section 7.3.8, such applications may include requests for payment on account of changes in the Work which 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 Such applications may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

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

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

§ 9.4 CERTIFICATES FOR PAYMENT

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

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

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

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

1. defective Work not remedied;
§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 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 promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor’s portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such 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 Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

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

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

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

§ 9.7 FAILURE OF PAYMENT

§ 9.7.1 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 arbitration, then the Contractor may, upon seven additional days’ written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.
§ 9.8 SUBSTANTIAL COMPLETION
§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

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

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

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

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

§ 9.9 PARTIAL OCCUPANCY OR USE
§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.4.1.5 and authorized by public authorities having jurisdiction over the Work. 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 written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the

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.

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

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

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

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:
1. liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
2. failure of the Work to comply with the requirements of the Contract Documents; or
3. terms of special warranties required by the Contract Documents.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY
§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS
§ 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY
§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:
1. employees on the Work and other persons who may be affected thereby;
2. the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
3. other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.
§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

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

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

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

§ 10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 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 verify that it has been rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect or both have reasonable objection to persons or entities 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. The Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up, which adjustments shall be accomplished as provided in Article 7.

§ 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) and provided that such damage, loss or expense is not due to the sole negligence of a party seeking indemnity.

§ 10.4 The Owner shall not be responsible under Section 10.3 for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents.
§ 10.5 If, without negligence on the part of the Contractor, the Contractor is held liable for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.6 EMERGENCIES
§ 10.6.1 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 Section 4.3 and Article 7.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 CONTRACTOR'S LIABILITY INSURANCE
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

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

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

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Section 9.10.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.2 OWNER'S LIABILITY INSURANCE
§ 11.2.1 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE
§ 11.3.1 Optionally, the Owner may require the Contractor to purchase and maintain Project Management Protective Liability insurance from the Contractor's usual sources as primary coverage for the Owner's, Contractor's and Architect's vicarious liability for construction operations under the Contract. Unless otherwise required by the Contract Documents, the Owner shall reimburse the Contractor by increasing the Contract Sum to pay the cost of purchasing and maintaining such optional insurance coverage, and the Contractor shall not be responsible for purchasing any other liability insurance on behalf of the Owner. The minimum limits of liability purchased with such coverage shall be equal to the aggregate of the limits required for Contractor's Liability Insurance under Sections 11.1.2 through 11.1.5.
§ 11.3.2 To the extent damages are covered by Project Management Protective Liability insurance, the Owner, Contractor and Architect waive all rights against each other for damages, except such rights as they may have to the proceeds of such insurance. The policy shall provide for such waivers of subrogation by endorsement or otherwise.

§ 11.3.3 The Owner shall not require the Contractor to include the Owner, Architect or other persons or entities as additional insureds on the Contractor’s Liability Insurance coverage under Section 11.1.

§ 11.4 PROPERTY INSURANCE

§ 11.4.1 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 11.4 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.4.1.1 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.

§ 11.4.1.2 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 which 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.

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

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

§ 11.4.1.5 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.

§ 11.4.2 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.

§ 11.4.3 Loss of Use Insurance. The Owner, at the Owner’s option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other hazards however caused.
§ 11.4.4 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.

§ 11.4.5 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 11.4.7 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.

§ 11.4.6 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 11.4. 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.

§ 11.4.7 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 11.4 or other property insurance applicable to the Work, except such rights as they have to proceed of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.4.8 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.4.10. 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.

§ 11.4.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with an arbitration award in which case the procedure shall be as provided in Section 4.6. 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.

§ 11.4.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved as provided in Sections 4.5 and 4.6. The Owner as fiduciary shall, in the case of arbitration, make settlement with insurers in accordance with directions of the arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

§ 11.5 PERFORMANCE BOND AND PAYMENT BOND
§ 11.5.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.
§ 11.5.2 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 permit a copy to be made.

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

§ 12.2 CORRECTION OF WORK
§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION
§ 12.2.1.1 The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

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

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance 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 which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work which 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 which the Contractor might have 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
§ 12.3.1 If the Owner prefers to accept Work which 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
§ 13.1.1 The Contract shall be governed by the law of the place where the Project is located.

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

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

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

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

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

§ 13.5 TESTS AND INSPECTIONS
§ 13.5.1 Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. 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 which do not become requirements until after bids are received or negotiations concluded.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.
§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect’s services and expenses shall be at the Contractor’s expense.

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

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

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

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

§ 13.7 COMMENCEMENT OF STATUTORY LIMITATION PERIOD
§ 13.7.1 As between the Owner and Contractor:

1 Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;

2 Between Substantial Completion and Final Certificate for Payment. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and

3 After Final Certificate for Payment. As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any Warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
§ 14.1 TERMINATION BY THE CONTRACTOR
§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

1 issuance of an order of a court or other public authority having jurisdiction which requires all Work to be stopped;

2 an act of government, such as a declaration of national emergency which requires all Work to be stopped;

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

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

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

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, profit and damages.

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

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor:

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

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

1. take possession of the site and 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 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 Architect, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

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

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

1. that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
2. that an equitable adjustment is made or denied under another provision of the Contract.
§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

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

1. cease operations as directed by the Owner in the notice;
2. take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
3. except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.
Standard Form of Agreement Between Owner and Contractor
where the basis of payment is a STIPULATED SUM

GENERAL INFORMATION

Purpose. AIA Document A101–1997 is intended for use on construction projects where the basis of payment is a stipulated sum (fixed price). It is suitable for any arrangement between the Owner and Contractor where the cost has been set in advance, either by bidding or by negotiation.

Related Documents. This document has been prepared for use in conjunction with AIA Document A201™–1997, General Conditions of the Contract for Construction, which is adopted into A101–1997 by a specific reference. This integrated set of documents is suitable for most projects; however, for projects of limited scope, use of AIA Document A107™–1997 may be considered.

The A101–1997 document is used as one part of the Contract Documents that memorialize the Contract for Construction between the Owner and the Contractor. The other Contract Documents are:

- General Conditions (i.e., A201–1997)
- Supplementary Conditions
- Drawings
- Specifications
- Modifications

Although the AIA does not produce standard documents for Supplementary Conditions, Drawings or Specifications, a variety of model and guide documents are available, including AIA's MASTERSPEC and AIA Document A511™, Guide for Supplementary Conditions.

AIA Document A101–1997 is published in conjunction with the following related documents:

- A201™–1997, General Conditions of the Contract for Construction
- A401™–1997, Standard Form of Agreement Between Contractor and Subcontractor
- A511, Guide for Supplementary Conditions
- A601™–1997, Instructions to Bidders
- B141™–1997, Standard Form of Agreement Between Owner and Architect
- B151™–1997, Abbreviated Standard Form of Agreement Between Owner and Architect
- C141™–1997, Standard Form of Agreement Between Architect and Consultant
- C142™–1997, Abbreviated Standard Form of Agreement Between Architect and Consultant

Dispute Resolution—Mediation and Arbitration. Through its adoption by reference of AIA Document A201–1997, this document contains provisions for mediation and arbitration of claims and disputes. Mediation is a non-binding process, but is mandatory under the terms of this agreement. Arbitration is mandatory under the terms of this agreement and binding in most states and under the Federal Arbitration Act. In a minority of states, arbitration provisions relating to future disputes are not enforceable but the parties may agree to arbitrate after the dispute arises. Even in those states, under certain circumstances (for example, in a transaction involving interstate commerce), arbitration provisions may be enforceable under the Federal Arbitration Act.

The AIA does not administer dispute resolution processes. To submit disputes to mediation or arbitration or to obtain copies of the applicable mediation or arbitration rules, call the American Arbitration Association at (800) 778-7879, or visit their Web site at www.adr.org.

Why Use AIA Contract Documents. AIA Contract Documents are the product of a consensus-building process aimed at balancing the interests of all parties on the construction project. The documents reflect actual industry practices, not theory. They are state-of-the-art legal documents, regularly revised to keep up with changes in law and the industry—yet they are written, as far as possible, in everyday language. Finally, AIA contract documents are flexible; they are intended to be modified to fit individual projects, but in such a way that modifications are easily distinguished from the original, printed language.

Use of Non-AIA Forms. If a combination of AIA documents and non-AIA documents is to be used, particular care must be taken to achieve consistency of language and intent among documents.
Letter Forms of Agreement. Letter forms of agreement are generally discouraged by the AIA, as is the performance of a part or the whole of the Work on the basis of oral agreements or understandings. The standard AIA agreement forms have been developed through more than 100 years of experience and have been tested repeatedly in the courts. In addition, the standard forms have been carefully coordinated with other AIA documents.

Standard Forms. Most AIA documents published since 1906 have contained in their titles the words "Standard Form." The term "standard" is not meant to imply that a uniform set of contractual requirements is mandatory for AIA members or others in the construction industry. Rather, the AIA standard documents are intended to be used as fair and balanced baselines from which the parties can negotiate their bargains. As such, the documents have won general acceptance within the construction industry and have been uniformly interpreted by the courts. Within an industry spanning 50 states—each free to adopt different, and perhaps contradictory, laws affecting that industry—AIA documents form the basis for a generally consistent body of construction law.

Use of Current Documents. Prior to using any AIA document, the user should consult an AIA component chapter or a current AIA Documents Price List to determine the current edition of each document.

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The AIA hereby grants the purchaser a limited license to reproduce a maximum of ten copies of a completed A101–1997, but only for use in connection with a particular project. The AIA will not permit reproduction outside of the limited license for reproduction granted above, except upon written request and receipt of written permission from the AIA.

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CHANGES FROM THE PREVIOUS EDITION

A101–1997 revises the 1987 edition of A101 to reflect changes made in AIA Document A201–1997. It incorporates alterations proposed by architects, contractors, owners and professional consultants. The following are some of the significant changes made to the contents of the 1987 edition of A101:


Article 2: The blank for exceptions to the Contractor's scope of Work has been eliminated.

Article 3: New emphasis is placed on the need to coordinate the date of commencement with the date of Substantial Completion. Space is also provided for bonus payments for early completion.

Article 5: Both progress payments and final payment are now covered in this article, entitled Payments. Payment of amounts not in dispute under Construction Change Directives is mandatory, as is release of retainage on completed Work at Substantial Completion. Advance payment to suppliers for materials and equipment not yet stored at the site is only permitted with the Owner's approval.

Article 6: Space is provided for identification of the Owner's and Contractor's representatives. Ten days' notice is required before a representative is changed.

USING THE A101–1997 FORM

Notices. Prospective bidders should be informed of any additional provisions which may be included in A101–1997, such as for liquidated damages or for stored materials, by an appropriate notice in the Bidding Documents and the provisions for Supplementary Conditions.

Modifications. Particularly with respect to professional or contractor licensing laws, building codes, taxes, monetary and interest charges, arbitration, indemnification, format and font size, AIA Contract Documents may require modification to comply with state or local laws. Users are encouraged to consult an attorney before completing or modifying a document.
In a purchased paper AIA Contract Document, necessary modifications may be accomplished by writing or typing the appropriate terms in the blank spaces provided on the document, or by attaching Supplementary Conditions, special conditions or referenced amendments. Modifications directly to purchased paper AIA Contract Documents may also be achieved by striking out language. However, care must be taken in making these kinds of deletions.

Under NO circumstances should standard language be struck out to render it illegible. For example, users should not apply blocking tape, correction fluid or Xs that would completely obscure text. Such practices may raise suspicion of fraudulent concealment, or suggest that the completed and signed document has been tampered with. Both parties should initial handwritten changes. Using AIA software, modifications to insert information and revise the standard AIA text may be made as the software permits. By reviewing properly made modifications to a standard AIA Contract Document, parties familiar with that document can quickly understand the essence of the proposed relationship. Commercial exchanges are greatly simplified and expedited, good faith dealing is encouraged, and otherwise latent clauses are exposed for scrutiny. AIA Contract Documents may not be retyped or electronically scanned. Retyping can introduce typographic errors and cloud legal interpretation given to a standard clause. Furthermore, retyping and electronic scanning are not permitted under the user's limited license for use of the document, constitute the creation of a derivative work and violate the AIA's copyright.

Cover Page

Date: The date represents the date the Agreement becomes effective. It may be the date an original oral agreement was reached, the date the Agreement was originally submitted to the Owner, the date authorizing action was taken or the date of actual execution. It will be the date from which the Contract Time is measured unless a different date is inserted under Section 3.1.

Parties: Parties to the Agreement should be identified using the full address and legal name under which this Agreement is to be executed, including a designation of the legal status of both parties (sole proprietorship, partnership, joint venture, unincorporated association, limited partnership or corporation [general, limited liability, closed or professional], etc.). Where appropriate, a copy of the resolution authorizing the individual to act on behalf of the firm or entity should be attached. Other information may be added, such as telephone numbers and electronic addresses.

Project: The proposed Project should be described in sufficient detail to identify: (1) the official name or title of the facility; (2) the location of the site; (3) the proposed building usage; and (4) the size, capacity or scope of the Project.

Architect: As in the other Contract Documents, the Architect's full legal or corporate title should be used.

Article 2 The Work of This Contract. If portions of the Work are to be performed by persons or entities other than the Contractor, these should be indicated in the Supplementary Conditions.

Article 3 Date of Commencement and Substantial Completion. The following items should be included as appropriate:

§ 3.1 The date of commencement of the Work should be inserted if it is different from the date of the Agreement. It should not be earlier than the date of execution (signing) of the Agreement. After the first sentence, enter either the specific date of commencement of the Work, or if a notice to proceed is to be used, enter the sentence, "The date of commencement shall be stipulated by the notice to proceed." When time of performance is to be strictly enforced, the statement of starting time should be carefully weighed.

§ 3.3 The time within which Substantial Completion of the Work is to be achieved may be expressed as a number of days (preferably calendar days) or as a specified date. If a specified date is used and the date of commencement is to be given in a notice to proceed, these dates must be carefully coordinated to allow sufficient time for completion of the Work. Any requirements for earlier Substantial Completion of portions of the Work should be entered here if not specified elsewhere in the Contract Documents.

Optionally, insert any provisions for liquidated damages relating to failure to complete on time, or for bonus payments for early completion. Liquidated damages are not a penalty to be inflicted on the Contractor, but must bear an actual and reasonably estimable relationship to the Owner's loss if construction is not completed on time. There is little or no legal precedent to support the proposition of linking a bonus with a penalty. If liquidated damages are to be assessed because of construction will result in actual loss to the Owner, the amount of damages for each day lost should be entered in the Supplementary Conditions or the Agreement. Factors such as confidentiality or the need to inform subcontractors about the amount of liquidated damages will help determine the placement of such language. If provision for liquidated damages is included, it should be carefully drafted by the Owner's attorney. Such a provision may be based on the following sample language:

"The Contractor and the Contractor's surety, if any, shall be liable for and shall pay the Owner the sums hereinafter stipulated as liquidated damages for each calendar day of delay until the Work is substantially complete: __________ Dollars ($ _______).

For further information on liquidated damages, penalties and bonus provisions, see AIA Document A511, Guide for Supplementary Conditions.

Article 4 Contract Sum

§ 4.1 Enter the Contract Sum payable to the Contractor.
§ 4.2 Identify any alternates described in the Contract Documents and accepted by the Owner. If decisions on alternates are to be made subsequent to execution of A101–1997, attach a schedule showing the amount of each alternate and the date it expires.

§ 4.3 Enter any unit prices, cash allowances or cash contingency allowances. If unit prices are not covered in greater detail elsewhere in the Contract Documents, the following provision for unit prices is suggested:

"The unit prices listed below shall determine the value of extra Work or changes in the Work, as applicable. They shall be considered complete and shall include all material and equipment, labor, installation costs, overhead and profit. Unit prices shall be used uniformly for additions or deductions."

Specific allowances for overhead and profit on Change Orders may be included under this section to forestall disputes over future Change Order costs.

Article 5 Payments

§ 5.1.2 Insert the time period covered by each Application for Payment if it differs from the one given.

§ 5.1.3 Insert the time schedule for presenting Applications for Payment, and indicate due dates for making progress payments. The last day upon which Work may be included in an Application should normally be no less than 14 days prior to the payment date, in consideration of the 7 days required for the Architect's evaluation of an Application and issuance of a Certificate for Payment and the time subsequently accorded the Owner to make Payment in Article 9 of A201. The Contractor may prefer a few additional days to prepare the Application. Due dates for payment should be acceptable to both the Owner and Contractor. They should allow sufficient time for the Contractor to prepare an Application for Payment, for the Architect to certify payment, and for the Owner to make payment. They should also be in accordance with time limits established by this Article and Article 9 of A201–1997.

§ 5.1.6.1 Indicate the percent retainage, if any, to be withheld when computing the amount of each progress payment. The Owner frequently pays the Contractor the bulk of the earned sum when payments fall due, retaining a percentage to ensure faithful performance. These percentages may vary with circumstances and localities. The AIA endorses the practice of reducing retainage as rapidly as possible, consistent with the continued protection of all affected parties. See AIA Document A511, Guide for Supplementary Conditions, for a complete discussion.

§ 5.1.6.2 Insert any additional retainage to be withheld from that portion of the Contract Sum allocable to materials and equipment stored at the site. Payment for materials stored off the site should be provided for in a specific agreement and enumerated in Section 7.6. Provisions regarding transportation to the site and insurance protecting the Owner's interests should be included.

§ 5.1.8 Describe any arrangements to reduce or limit retainages indicated in Sections 5.1.6.1 and 5.1.6.2, if not explained elsewhere in the Contract Documents. A provision for reducing retainage should provide that the reduction will be made only if the Architect judges that the Work is progressing satisfactorily. If the Contractor has furnished a bond, demonstration of the surety's consent to reduction in or partial release of retainage must be provided before such reduction is effected. Use of AIA Document G707A™ is recommended.

§ 5.2.2 Insert the date by which Owner shall make final payment, if it differs from the one stated. When final payment is requested, the Architect should ascertain that all claims have been settled or should define those which remain unsettled. The Architect should obtain the Contractor’s certification required by Article 9 of A201–1997 and must determine that, to the best of the Architect's knowledge and belief and according to the Architect's final inspection, the requirements of the Contract have been fulfilled.

Article 7 Miscellaneous Provisions

§ 7.2 Enter any agreed-upon interest rate for overdue payments.

§ 7.3 Identify the Owner's representative and indicate how that person may be contacted.

§ 7.4 Identify the Contractor’s representative and indicate how that person may be contacted.

§ 7.6 Insert other provisions here.

Article 8 Enumeration of Contract Documents

A detailed enumeration of all Contract Documents must be made in this article.

EXECUTION OF THE AGREEMENT

The Agreement should be executed in not less than triplicate by the Owner and the Contractor. The persons executing the Agreement should indicate the capacity in which they are acting (i.e., president, secretary, partner, etc.) and the authority under which they are executing the Agreement. Where appropriate, a copy of the resolution authorizing the individual to act on behalf of the firm or entity should be attached.

Standard Form of Agreement Between Owner and Contractor
where the basis of payment is a STIPULATED SUM

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

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

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

The Project is: (Name and location)

The Owner and Contractor agree as follows.

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

AIA Document A201-1997, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

This document has been approved and endorsed by The Associated General Contractors of America.
ARTICLE 1 THE CONTRACT DOCUMENTS
The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement; these form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 8.

ARTICLE 2 THE WORK OF THIS CONTRACT
The Contractor shall fully execute the Work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.
(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

If, prior to the commencement of the Work, the Owner requires time to file mortgages, mechanic’s liens and other security interests, the Owner’s time requirement shall be as follows:

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

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than days from the date of commencement, or as follows:
(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. Unless stated elsewhere in the Contract Documents, insert any requirements for earlier Substantial Completion of certain portions of the Work.)

, subject to adjustments of this Contract Time as provided in the Contract Documents.
(Insert provisions, if any, for liquidated damages relating to failure to complete on time or for bonus payments for early completion of the Work.)

ARTICLE 4 CONTRACT SUM
§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor’s performance of the Contract. The Contract Sum shall be Dollars ($ ), subject to additions and deductions as provided in the Contract Documents.
§ 4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:
(State the numbers or other identification of accepted alternates. If decisions on other alternates are to be made by the Owner subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires)

§ 4.3 Unit prices, if any, are as follows:

ARTICLE 5 PAYMENTS
§ 5.1 PROGRESS PAYMENTS
§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

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

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment.

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

§ 5.1.5 Applications for Payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.
§ 5.1.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

1. Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of percent (%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.8 of AIA Document A201–1997;

2. Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of percent (%);

3. Subtract the aggregate of previous payments made by the Owner; and

4. Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–1997.

§ 5.1.7 The progress payment amount determined in accordance with Section 5.1.6 shall be further modified under the following circumstances:

1. Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and
   (Section 9.8.5 of AIA Document A201–1997 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)

2. Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201–1997.

§ 5.1.8 Reduction or limitation of retainage, if any, shall be as follows:
(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

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

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

1. the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–1997, and to satisfy other requirements, if any, which extend beyond final payment; and

2. a final Certificate for Payment has been issued by the Architect.

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

ARTICLE 6 TERMINATION OR SUSPENSION
§ 6.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–1997.

§ 6.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–1997.
ARTICLE 7 MISCELLANEOUS PROVISIONS

§ 7.1 Where reference is made in this Agreement to a provision of AIA Document A201–1997 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

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

(Usury laws and requirements under the Federal Truth in Lending Act, similar state and local consumer credit laws and other regulations at the Owner's and Contractor's principal places of business, the location of the Project and elsewhere may affect the validity of this provision. Legal advice should be obtained with respect to deletions or modifications, and also regarding requirements such as written disclosures or waivers.)

§ 7.3 The Owner's representative is:
(Name, address and other information)

§ 7.4 The Contractor's representative is:
(Name, address and other information)

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

§ 7.6 Other provisions:
ARTICLE 8 ENUMERATION OF CONTRACT DOCUMENTS
§ 8.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated as follows:


§ 8.1.3 The Supplementary and other Conditions of the Contract are those contained in the Project Manual dated , and are as follows:

<table>
<thead>
<tr>
<th>Document</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
</table>

§ 8.1.4 The Specifications are those contained in the Project Manual dated as in Section 8.1.3, and are as follows: (Either list the Specifications here or refer to an exhibit attached to this Agreement.)

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
</table>

§ 8.1.5 The Drawings are as follows, and are dated below: (Either list the Drawings here or refer to an exhibit attached to this Agreement.)

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Date</th>
</tr>
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</table>
§ 8.1.6 The Addenda, if any, are as follows:

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Pages</th>
</tr>
</thead>
</table>

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 8.

§ 8.1.7 Other documents, if any, forming part of the Contract Documents are as follows:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–1997 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

This Agreement is entered into as of the day and year first written above and is executed in at least three original copies, of which one is to be delivered to the Contractor, one to the Architect for use in the administration of the Contract, and the remainder to the Owner.

OWNER (Signature)

(Printed name and title)

CONTRACTOR (Signature)

(Printed name and title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

DIVISION 1

SECTION 1A - SPECIAL CONDITIONS

INDEX TO SPECIAL CONDITIONS

1. GENERAL
2. DIVISION OF SPECIFICATIONS
3. DISPUTES
4. ALLOCATION OF WORK
5. OWNER'S RIGHT TO STOP THE WORK
6. NOTICE AND SERVICE THEREOF
7. CODES AND ORDINANCES
8. TIMES FOR COMPLETION
9. LIQUIDATED DAMAGES
10. ORDERING MATERIALS
11. STORAGE OF MATERIALS
12. LAYOUT OF WORK AREA
13. RECORD DRAWINGS
14. HARARDOUS MATERIALS
15. PARKING FACILITIES
16. USE OF THE PREMISES - CONTRACT LIMIT
17. CONSTRUCTION UTILITIES
18. JOB SIGN
19. PRE-CONSTRUCTION CONFERENCE
20. PROGRESS MEETINGS
21. CONTRACTOR COORDINATION
22. CUTTING AND PATCHING
23. GENERAL CONTRACTOR'S RESPONSIBILITY FOR DEVIATIONS
24. PAYMENT FOR OFF-SITE STORAGE
DIVISION 1

SECTION 1A - SPECIAL CONDITIONS

1. **GENERAL:**

   A. These Specifications and Drawings accompanying them describe the work to be done and the materials to be furnished for Replacement of the Campground Grocery at Green River State Park.

   B. The work under this Contract does not include any items marked N.I.C. on the Drawings (Not In Contract).

   C. Should any error or inconsistency appear in Drawings or Specifications, the Contractor, before proceeding with the work, must make mention of the same to the Architect for proper adjustment, and in no case proceed with the work in uncertainty or with insufficient drawings.

   D. The Contractor and each Subcontractor shall be responsible for verification of all measurements at the building before ordering any materials or doing any work. No extra charge or compensation shall be allowed due to differences between actual dimensions and dimensions indicated on the Drawings. Any such discrepancy in dimensions which may be found shall be submitted to the Architect for his consideration before the Contractor proceeds with the work in the affected areas.

   E. Contractors shall follow sizes in Specifications or figures on Drawings, in preference to scale measurements and follow detail drawings in preference to general drawings.

   F. Where it is obvious that a drawing illustrates only a part of a given work or of a number of items, the remaining shall be deemed repetitious and so constructed.
2. **DIVISION OF SPECIFICATIONS:**
   A. Division of Specifications into sections is done for convenience of reference and is not intended to control contractors in dividing work among subcontractors or to limit scope of work performed by any trade under any given section.

3. **DISPUTES:**
   A. Contractor is hereby put on notice that it is his contractual obligation to adjust differences between his several subcontractors. Attempts to have the Division of Engineering settle disputes between the Prime Contractor and his subcontractors, or between subcontractors, will not be given consideration.

4. **ALLOCATION OF WORK:**
   A. Where certain materials are specified to be installed under various headings, it shall be the responsibility of the Prime Contractor to reallocate such work under the proper subcontractor if the specification is in conflict with local jurisdiction.

5. **OWNER'S RIGHT TO STOP THE WORK:**
   A. If the Contractor fails to correct defective work or persistently fails to supply materials or equipment in accordance with the Contract Documents, the Owner may order the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated.

6. **NOTICE AND SERVICE THEREOF:**
   A. Any notice to any Contractor from the Owner relative to any part of this Contract shall be writing and considered delivered and the service thereof completed, when said notice is posted, by registered mail, to the said Contractor or his last given address, or delivered in person to said Contractor or his authorized representative on the work.
7. **CODES AND ORDINANCES:**

A. All branches of the work shown on the Plans or specified, whether specifically mentioned or not, shall be executed in strict compliance with all local or state regulations and codes, and shall be in compliance with all national codes, when same have jurisdiction.

8. **TIMES FOR COMPLETION:**

A. **Substantial Completion:** Subject to the conditions of Article 31 "Delays and Extensions of Time" of the General Conditions, the total work to be done under this combined Construction Contract shall be commenced at the time stipulated in the Work Order to the Contractor and shall be substantially completed within sixty (180) consecutive calendar days thereafter.

   The date of Substantial Completion shall be the date certified by the Architect when the work is sufficiently complete, in accordance with the Contract Documents, so the Owner may conditionally accept, and beneficially occupy and use, all of the facilities provided under this Construction Contract.

B. **Final Completion:** Subject to the conditions of Article 31 "Delays and Extensions of Time" of the General Conditions, the total work to be done under this combined Construction Contract shall be fully completed within fifteen (15) consecutive calendar days after the Date of Substantial Completion.

C. The Date of Final Completion shall be the date that the work is complete and all Contract requirements have been fulfilled by the Contractor.

9. **LIQUIDATED DAMAGES:**

A. As actual damages for any delay in completion are impossible to determine, the contractors and their sureties shall be liable for and shall pay to the Owner in accordance with Article 10 above, the sum of one hundred fifty dollars ($150.00) as fixed, agreed and liquidated damages for each calendar day of delay until the Contract work is
Substantially Completed, and the sum of one hundred fifty dollars ($400.00) as fixed, agreed and liquidated damages for each calendar day of delay until the Contract work reaches Final Completion.

10. **ORDERING MATERIALS:**
   
   A. Immediately following Award of Contract for this work, Contractor shall determine source of supply for all materials and length of time required for their delivery, including materials of subcontractors, and order shall be placed for such materials promptly.
   
   B. If, for any reason, any item specified will not be available when needed and Contractor can show that he has made a reasonably persistent effort to obtain item in question, the Architect is to be notified in writing within 15 days after Contract is signed; otherwise, the Contractor shall not be excused for delays in securing material specified and will be held accountable if completion of building is thereby delayed.

11. **STORAGE OF MATERIALS:**
   
   A. Each Contractor providing materials and equipment shall be responsible for the proper and adequate storage of his materials and equipment, and for the removal of same upon completion of his work. Storage of materials at the site shall be confined to areas within Contract Limits or as otherwise designated by the Owner at the Pre-Construction Conference.

12. **LAYOUT OF WORK AREA:**
   
   A. The General Contractor shall lay out the work and be responsible for all lines, levels and measurements of all work executed under this Contract; he shall verify the figures before laying out the work and will be held responsible for any error resulting from his failure to do so.
   
   B. The General Contractor shall be prepared to guarantee to each of his subcontractors the dimensions which they may require for the layout and fitting of their work to the surrounding work.

13. **RECORD DRAWINGS:**
A. The Owner will furnish one (1) set of blue line prints which the Contractor shall keep on file in the field office. The Contractor shall record on these prints, from day to day as the work progresses, all changes and deviations from the Contract Drawing, with special emphasis on the exact location of all work concealed from view by offset distances to surface improvements such as building corners, curbs, etc. Entries and notations shall be neat, legible and permanent. These prints shall be delivered to the Architect upon completion of this project. Approval of final payment will be contingent upon compliance with these provisions.

14. HAZARDOUS MATERIALS:

A. The abatement of hazardous material is not a part of this contract. In the event that a hazardous material is encountered, work shall be suspended in the vicinity of the discovered material and the architect shall be immediately notified.

15. PARKING FACILITIES:

A. Parking arrangements for the contractor and his employees shall be determined at the pre-construction conference. Parking outside of the assigned area is prohibited.

16. USE OF THE PREMISES - CONTRACT LIMIT:

A. The Contractor shall confine his operations, including delivery and unloading of materials and equipment, to the areas within the designated Contract Limits.

B. The Contract Limits shall be defined as the area permitted by the Owner's officials for use by the Contractor in the execution of the work. The Contractor's operations will at no time be permitted to jeopardize the use of adjacent streets. The Contract Limits and any additional staging areas, dumpster locations, etc. and limits of same shall be discussed and located at the Pre-Construction Conference.

C. The Contractor shall prepare a general "Plan of Operations." The plan of operations shall show concisely the manner in which the Contractor
proposes to carry out the work, shall indicate the areas where work will be first carried on, the course the Contractor intends to pursue, sequence of operations, the traffic patterns for delivery of materials and equipment, etc. Once this plan of operations, in writing, is agreed upon, the Contractor shall not deviate from the plan unless approval is secured from the Architect.

17. CONSTRUCTION UTILITIES:
   A. With respect to temporary utilities (electric and water), the Contract shall arrange and pay for the usage of said utilities; and, the Contractor shall be responsible for all hook-ups, removal, patching and repair costs incurred over the course of the Construction Contract.

18. JOB SIGN:
   A. The Contractor shall erect one 8'-0" X 4'-0" x 3/4" exterior grade douglas fir plywood sign adequately supported by 4" x 4" posts 3'-0" into the ground. The plywood shall have the edges sealed, all faced primed and given two coats of exterior paint. The color, style and arrangement of the lettering will be furnished by the Architect. The sign shall contain the names and addresses of the Architect, Contractor, and name of project. The sign shall be erected in a location selected at the pre-construction conference.

19. PRE-CONSTRUCTION CONFERENCE:
   A. Before any work is started, there shall be a Pre-Construction Conference attended by all representatives of the General Contractor, all Subcontractors, Owner, Using Agency, Architect and Engineers.

20. PROGRESS MEETINGS:
   A. With the express purpose of expediting construction and providing the opportunity for cooperation of affected parties, meetings may be called which shall be attended by representatives of: (1) Using Agency; (2) Division of Engineering; (3) the Architect and Engineers; (4) the General Contractor; (5) all Subcontractors. A location on or near the site will be designated where such meetings will be held. The frequency of meeting shall be at the discretion of the Architect and
Owner; however, a minimum of one (1) per month shall be conducted. Should the project fall behind schedule or etc., additional meetings shall be called at the discretion of the Architect, Owner, and/or Contractor.

21. CONTRACTOR COORDINATION:

A. The General Contractor and all Subcontractors shall cooperate and coordinate their work to expedite the progress of the project. All Subcontractors shall review and refer to the Drawings and Specifications of other trades involved with their particular work before proceeding. Any work installed which conflicts with another trade and had not been brought to the attention of the Architect prior to installation shall be removed at no additional expense to the Owner.

22. CUTTING AND PATCHING:

A. Cutting and patching shall be done by craftsmen skilled and experienced in the trade or craft that installed or furnished the original work. Repairs shall be equal in quality and appearance to similar adjacent work and shall not be obviously apparent as a patch or repair. Work that cannot be satisfactorily repaired shall be removed and replaced.

23. GENERAL CONTRACTOR'S RESPONSIBILITY FOR DEVIATIONS:

A. Plans and Specifications for this project show specific structural and architectural diagrams and devices for each item. The mention of acceptable bidder does not necessarily imply that their particular "standard" product is totally adaptable to details shown. Therefore the cost of deviations, extensions or adjustments required for the low bidder's product must be included in the General Contractor's bid.

24. PAYMENT FOR OFF-SITE STORAGE:

A. The Owner shall pay for materials stored off-site; however, the following conditions shall be required by the Contractor. First, the item(s) in question must be stored in a "bonded-warehouse" and such item(s) shall be tagged to the Project and inspected by the
Architect/Engineer in order to determine that they are properly stored. Second (along with and supporting the Periodic Application for Payment), the Contractor shall submit: (1) a copy of the original invoice; and (2) a certificate of Insurance stating the item(s), job, and place of storage. The Contractor shall also reflect on the Application for Payment an additional ten percent (10%) retainage to be withheld by the Owner (over and beyond the above referenced retainages, as stated in Article 16 of the General Conditions), for the item(s) stored off-site.

END OF SECTION 1A
DIVISION 1

SECTION 1B - TEMPORARY FACILITIES AND CONTROLS

GENERAL:

This section includes temporary facilities, temporary protection, temporary operations, and other related items necessary to complete the project as specified.

The requirements of this section apply to all trades and all subcontractors and shall take precedence over any contradictory requirements in the General Conditions or Supplemental General Conditions.

FIELD OFFICES:

The Contractor and major subcontractors shall provide office space for their own use and the Architect's use of project business with heat, lighting and telephone. A complete set of Drawings and Specifications, a copy of all modifications to the Contract, permits and approved shop drawings shall be kept on file at all times, and made available for review by the Architect at anytime. Relocation of the temporary offices during progress of work by the Contractor or subcontractor shall be at their own expense. The office space shall be of a size suitable of uses for conducting project meetings.

TEMPORARY SIGNS:

Unless required by law or required elsewhere herein, signs or advertisements are not permitted to be displayed without approval of the Architect. However, the Contractor shall fabricate and install a job sign as specified in the special conditions. The Contractor shall also post "no trespassing" and "danger-construction zone" signs not-to-exceed every twenty feet along perimeter of construction fence.

SANITARY FACILITIES:

The Contractor shall provide temporary sanitary facilities for use of his forces.

All such temporary facilities and services shall be furnished in strict accordance w/existing governing health regulations.
POTABLE WATER:

Drinking water shall be provided from an approved safe source, so piped or transported as to be kept clean and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing governing health regulations.

COMMUNICATIONS FACILITIES:

The Contractor shall provide a mobile or hardwired telephone on site for use by his forces and for the convenience of the Architect and Owner.

CLEANING AND TRASH REMOVAL:

The General Contractor shall provide trash containers of adequate size and number on the site. The contractor shall collect and deposit his debris in the containers and shall remove all trash from the project daily.

The General Contractor shall clean the entire construction area daily.

Workmen shall use only the areas designated by in the pre-construction conference for eating lunch. The General Contractor shall place covered trash containers in each area. Containers shall be emptied daily. It shall be the General Contractor's responsibility to supervise the use of the lunch areas and to see that all workmen place their lunch waste in the containers.

Failure to comply with the above requirements shall be cause for stopping all work until the condition is corrected.

Burning of scrap materials, trash, or debris on the Owner's property will not be permitted.

STREET CLEANING:

The Contractor shall provide both supervision, labor and equipment to insure that building materials, debris and/or other materials that may fall from vehicles onto streets or walks will be removed at once and that such material or debris is not permitted to be tracked, carried, or blown onto other areas of streets or walks or other parts of the Owner's property or adjacent properties and streets. Such care and control must be provided on a continuous basis during all periods of activity during which materials or debris might fall onto the grounds and on a regular schedule at other times.
TEMPORARY WEATHER AND SAFETY ENCLOSURES:

Temporary enclosures shall be provided at openings in roof, walls, etc... as necessitated by weather conditions and for safety and security. Temporary enclosures shall also be provided to contain the spread of dust and debris where it may affect neighboring property. Enclosures shall be erected in a safe, suitable manner of appropriate materials, maintained in good repair, and removed when no longer needed. Protect adjacent work from damage as necessary. The manner and plan for temporary enclosures shall be detailed and agreed upon at the pre-construction meeting.

TEMPORARY WORK:

All required temporary work shall be provided for the safe and proper performance of the Contract Work. The Contractor shall be responsible for the adequate design and construction of all formwork, falsework, underpinning, steel work, scaffolding, stairs and any other temporary work, collectively referred to in this paragraph as "temporary work" used in the execution of the Contract Work. The Contractor shall certify to the Owner that the design and erection drawings for all such temporary work have been checked and approved as adequate by a professional engineer licensed in the State of Kentucky who has had at least five years of experience as a structural engineer, and that the temporary work has been constructed in conformance with the design which was checked and approved by said professional engineer. The Contractor and the professional engineer retained by the Contractor to approve the design and the erection drawings for such temporary work erected during the course of the job shall be responsible for the proper design, construction, dismantling, and removal of such temporary work.

MATERIAL STORAGE:

Prior to any construction materials arriving at the job site, the General Contractor, Architect and Owner’s Representative will jointly establish the area for storage. Plastic or paper shipping wrappers shall not, nor are they intended to, protect the materials while they are stored in outside areas.

Construction materials are not to be "warehoused" at the site, in an unprotected area. Materials are to be delivered to the project as needed or stored at the site in an approved trailer. Location of any storage trailer or office trailers will be determined at the Pre-Construction Conference. Periodical estimates covering payment for construction materials stored off-site will be approved provided:

Storage is in a structure that protects the material from the elements.
Materials are properly segregated and marked for the project. Materials are insured for full value and insurance policy or rider to existing policy furnished.

A representative of the Architect inspects the stored materials and verifies their presence.

SECURITY AND SAFETY FENCING:

The Contractor shall erect and maintain bright orange polyvinyl coated nylon mesh (minimum) temporary construction fencing to protect the public from exposure to hazards. The fencing shall be four feet tall minimum. The plan for this fencing shall be determined at the pre-construction conference.

END OF SECTION 1B
DIVISION 1

SECTION 1C - PROJECT CLOSEOUT

1. GENERAL

A. The General Conditions, Special Conditions, and the applicable portions of Division 1 of the Specifications are a part of this section.

2. DESCRIPTION OF REQUIREMENTS

A. Definitions. Closeout is hereby defined to include general requirements near the end of Contract Time, in preparation for final acceptance, final payment, normal termination of Contract, acceptance by Owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Divisions 2 through 16.

3. PREREQUISITES TO FINAL COMPLETION

A. General. Prior to requesting Architect's inspection for certification of final completion (for either entire work or portions thereof), complete the following and list known exceptions in request:

(1) Include supporting documentation for completion as indicated in these Contract Documents.

(2) Submit specific warranties, workmanship, maintenance bonds, maintenance agreements, final certifications and similar documents.

(3) Obtain and submit releases enabling Owner's full and unrestricted use of the work and access to services and utilities, including (where required) occupancy permits, operating certificates, and similar releases.

(4) Submit record drawings, maintenance manuals, damage or settlement survey, and similar final record information.
(5) Deliver tools, spare parts, extra stocks or materials, and similar physical items to Owner.

(6) Discontinue and remove from project site temporary facilities and services, along with construction tools and facilities, mock-ups, and similar elements.

(7) Complete final cleaning up requirements, including touch-up painting of marred surfaces.

B. **Inspection Procedures.** Upon receipt of Contractor's request, Architect will either proceed with inspection or advise Contractor of prerequisites not fulfilled. Following initial inspection, Architect will either prepare Certificate of Final Completion, or advise Contractor of work which must be performed prior to issuance of Certificate; and repeat inspection when requested and assured that work has been completed.

4. **PREREQUISITES TO FINAL ACCEPTANCE**

A. **General.** Prior to requesting Architect's final inspection for certification of final acceptance and final payment, as required by General Conditions, complete the following and list known exceptions (if any) in request:

(1) Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

(2) Submit certified copy of Architect's final punch list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by Architect.

B. **Reinspection Procedure.** Upon receipt of Contractor's notice that the work has been completed, including punch list items resulting from earlier inspections, and excepting incomplete items delayed because of acceptable circumstances, Architect will reinspect the work. Upon completion of reinspection, Architect will either prepare certificate of final acceptance or advise Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary,
procedure will be repeated. Exhaustive inspections will not be tolerated by the Architect. Reinspections beyond the second inspection are defined as exhaustive and will be at the expense of the Contractor.

5. RECORD DOCUMENT SUBMITTALS

A. **General.** Specific requirements for record documents are indicated in individual sections of these specifications. Other requirements are indicated in General Conditions. General submittal requirements are indicated in "Submittals" sections. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistant location; provide access to record documents for Architect's reference during normal working hours.

B. **Record Drawings.** Maintain a white-print set (blue-line or black-line) of Contract Drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark-up new information which is recognized to be of importance to Owner, but was for some reason not shown on either Contract Drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change-order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of each set. Upon completion of project, submit to Architect.

C. **Record Specifications.** Maintain one copy of Specifications, including Addenda, Change Orders and similar modifications issued in printed form during construction, and mark-up variations (of substance) in actual work in comparison with text of Specifications and modifications as issued. Give particular attention to substitutions, selection of options, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by
direct observation. Note related record drawing information and product data, where applicable. Upon completion of mark-up, submit to Architect for Owner's records.

D. Miscellaneous Record Submittals. Refer to other sections of these Specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to date(s) of final completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to Architect for Owner’s records.

6. FINAL CLEANING

A. General. Special cleaning for specific units of work is specified in sections of Division 2 through 16. General cleaning during progress of work is specified in General Conditions and as temporary services in "Temporary Facilities" section of this division. Provide final cleaning of the work, at time indicated, consisting of cleaning each surface or unit of work to normal "clean" condition.

B. Compliances. Comply with safety standards and governing regulations for cleaning operations. Do not burn or bury debris or excess materials on Owner’s property, or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from site and dispose of in a lawful manner.

C. Where extra materials of value remaining after completion of associated work have become Owner's property, dispose of these to Owner's best advantage as directed.

END OF SECTION 1C
SECTION 02070 - SELECTIVE DEMOLITION

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. Demolition and removal of selected items within a building.
   2. Demolition and removal of selected site elements.
   3. Patching and repairs.

1.3 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.
B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.
C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.
D. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.4 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.
B. Historical items, relics, and similar objects including, but not limited to, cornerstones and
their contents, commemorative plaques and tablets, antiques, and other items of interest or value to the Owner, which may be encountered during selective demolition, remain the Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to the Owner.

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

B. Proposed dust-control measures.

C. Proposed noise-control measures.

D. Schedule of selective demolition activities indicating the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
   2. Coordination for shutoff, capping, and continuation of utility services.

E. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.

F. Record drawings at Project closeout according to Division 1 Section "Contract Closeout."

   1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.6 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed selective demolition Work similar to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Owner assumes no responsibility for actual condition of buildings to be selectively demolished.
   1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

B. Asbestos: It is not expected that asbestos will be encountered in the Work. If any materials suspected of containing asbestos are encountered, do not disturb the materials.
Immediately notify the Architect and the Owner.

1. Existing asbestos will be removed by Owner before start of Work.

C. Storage or sale of removed items or materials on-site will not be permitted.

PART 2 - PRODUCTS (Not Applicable)

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
2. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Architect.

E. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage
during selective demolition operations.

1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to governing authorities.
   a. Provide not less than 72 hours' notice to Owner if shutdown of service is required during changeover.

B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving building to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.
2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other buildings before proceeding with selective demolition.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION

A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

B. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces and new construction to ensure that no water leakage or damage occurs to structure or interior areas.
5. Protect walls, ceilings, floors, and other existing finish work that are to remain and are exposed during selective demolition operations.
D. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to be selectively demolished.

   1. Strengthen or add new supports when required during progress of selective demolition.

3.4 POLLUTION CONTROLS

A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

   1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.5 SELECTIVE DEMOLITION

A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete work within limitations of governing regulations and as follows:

   1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition work above each floor or tier before disturbing supporting members on lower levels.

   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Where adjacent surfaces or construction is subject to damage by impact or vibration, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.

   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

   4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

   5. Maintain adequate ventilation when using cutting torches.

   6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
10. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.

C. Remove resilient floor coverings and adhesive according to recommendations of the Resilient Floor Covering Institute's (RFCI) "Recommended Work Practices for the Removal of Resilient Floor Coverings" and Addendum.
   1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.

3.6 PATCHING AND REPAIRS

A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
   1. Completely fill holes and depressions in existing masonry walls to remain with an approved masonry patching material, applied according to manufacturer's printed recommendations.

C. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.

D. Patch and repair floor and wall surfaces in the new space where demolished walls or partitions extend one finished area into another. Provide a flush and even surface of uniform color and appearance.
   1. Closely match texture and finish of existing adjacent surface.
   2. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
   3. Where patching smooth painted surfaces, extend final paint coat over entire unbroken surface containing the patch after the surface has received primer and second coat.
   4. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
5. Inspect and test patched areas to demonstrate integrity of the installation, where feasible.

E. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.7 DISPOSAL OF DEMOLISHED MATERIALS
A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.
C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.8 CLEANING
A. Sweep the building broom clean on completion of selective demolition operation.

END OF SECTION 02070
SECTION 03300 - 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, reinforcing, mix design, placement procedures, and finishes.

B. Cast-in-place concrete includes the following:
   1. Foundations and footings.
   2. Slabs-on-grade.
   3. Insulated Concrete Walls (ICF).

C. Coordination: Unless other satisfactory agreements are specifically entered into by contractors concerned, all miscellaneous iron and steel, sleeves, anchors, etc., required by work of other contractors, will be furnished and installed by such other contractors with the cooperation of this contractor.

1.3 SUBMITTALS

A. General: Submit according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joint systems, curing compounds, dry-shake finish materials, and others if requested by Architect.

C. Mix Design: Submit according to specified requirements herein using form included at the end of this section.

D. Shop drawings for reinforcement detailing, fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.

E. Submit drawings in the form of one (1) reproducible and two (2) prints.

F. Laboratory test reports for concrete mix design with the following data:
   1. Method used to determine the proposed mix design (per ACI 301, Section 4).
   2. Gradation and quantity of fine and coarse aggregates.
   3. Proportions of all ingredients including all admixtures added either at the time of batching or at the job site.
   5. Slump - ASTM C143.
6. Certification and test results of the total water soluble chloride ion content of the design mix - FHWA RD-77 or AASHTO T 260-84.
7. Air content of freshly mixed concrete by the pressure method, ASTM C231, or the volumetric method, ASTM C173.
9. Strength at 7 and 28 days - ASTM C39. Document strength on basis of previous field experience or trial mixtures, per ACI 301 Section 4. Submit strength test records, mix design materials, conditions, and proportions for concrete used for record of tests, standard calculation, and determination of required average compressive strength.
10. Complete and include architect’s standard mix design submittal form for each mix. A blank copy is included at the end of this section.

G. Laboratory test reports for concrete materials or material certificates in lieu of material laboratory test reports. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

H. Drawings showing proposed construction and/or contraction joint locations.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Each contractor having reference to ACI Documents shall maintain copies of same on project site.

B. AMERICAN CONCRETE INSTITUTE

1. ACI 117-90 - Tolerance for Concrete Construction and Material.
2. ACI 211.1-91 - Selecting Proportions Normal, Heavyweight and Mass.
3. ACI 301.1.96 - Specification for Structural Concrete for Buildings.
4. ACI 302.1R-96 - Guide for Concrete Floor and Slab Construction.
5. ACI 304.2R-95 - Placing Concrete by Pumping Methods.
7. ACI 306R-88 - Cold Weather Concreting.
8. ACI 308-92 - Standard Practice for Curing Concrete.
10. ACI 311 - Recommended Practice for Concrete Inspection.
11. ACI 315-92 - Details and Detailing of Concrete Reinforcement.
12. ACI 318-95 - Building Code Requirements for Reinforced Concrete and Commentary.

C. AMERICAN SOCIETY FOR TESTING AND MATERIAL (ASTM)

1. ASTM A82 - Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. ASTM A185 - Specification for Steel Welded Wire Fabric, Plain, For Concrete Reinforcement.
3. ASTM A615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
4. ASTM C31 - Practice for Making and Curing Concrete Test Specimens in the Field.
5. ASTM C33 - Specification for Concrete Aggregates.
8. ASTM C143 - Test Method for Slump of Hydraulic Cement Concrete.
11. ASTM C172 - Practice for Sampling Freshly Mixed Concrete.
12. ASTM C231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
15. ASTM C494 - Specification for Chemical Admixtures for Concrete.
16. ASTM C618 - Specification for Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete.
18. ASTM E-329 - Inspecting and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

D. CONCRETE REINFORCING STEEL INSTITUTE (CRSI):

2. CRSI 63 - Recommended Practice for Placing Reinforcing Bars.
3. CRSI 65 - Recommended Practice for Placing Bar Nomenclature.

E. Qualifications of Workers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper execution of the work required by this Division.

F. Materials and installed work may require testing and retesting at any time during progress of Work. Tests, including retesting of rejected materials for installed Work, shall be done at Contractor's expense.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Form for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Carton Forms: Biodegradable paper surface, treated for moisture-resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
D. Form Release Agent: Provide commercial formulation form release agent with a maximum volatile organic compounds (VOCs), not to exceed those allowable by jurisdictional regulations, that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

E. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1 1/2 inches to the plane of the exposed concrete surface.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.


C. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I. High early strength (when specified), ASTM C150, Type III.

1. Use one brand of cement throughout Project unless otherwise acceptable to Architect.

B. Fly Ash: ASTM C 618, Type C or F, except maximum loss on ignition: 3%.

C. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.

1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that cause spalling or surface discoloration due to oxidation.

2. Aggregate size limit for the insulated wall panels is 3/8 inch maximum.

D. Water: Potable.

E. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

   a. Air-Mix or Perma-Air, Euclid Chemical Co.
   b. Darex AEA or Daravair, W.R. Grace & Co.
   c. MB-VR or Micro-Air, Master Builders, Inc.
d. Sealtight AEA, W.R. Meadows, Inc.
e. Sika AER, Sika Corp.
f. Catexol A.E. 260, Axim Concrete Technologies.

F. Water-Reducing Admixture: ASTM C 494, Type A.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

   b. Eurcon WR-75, Euclid Chemical Co.
   c. WRDA, W.R. Grace & Co.
   d. Pozzolith Normal or Polyheed, Master Builders, Inc.
   e. Metco W.R., Metalcrete Industries.
   g. Plastocrete 161, Sika Corp.
   h. Catexol 1000N, Axim Concrete Technologies.

G. High-Range Water-Reducing Admixture: ASTM C 494, Type F or Type G.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

   a. Super P, Anti-Hydro Co., Inc.
   b. Eucon 37, Euclid Chemical Co.
   c. WRDA 19 or Daracem, W.R. Grace & Co.
   d. Rheobuild or Polyheed, Master Builders, Inc.
   e. Superslump, Metalcrete Industries.
   f. PSPL, Prokrete Industries.
   g. Sikament 300, Sika Corp.
   h. Catexol 1000SP-MN, Axim Concrete Technologies.

H. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

   a. Q-Set, Conspec Marketing & Manufacturing Co.
   b. Accelguard 80, Euclid Chemical Co.
   d. Pozzutec 20, Master Builders, Inc.
   e. Accel-Set, Metalcrete Industries.

I. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

   a. Eucon Retarder 75, Euclid Chemical Co.
   b. Daratard-17, W.R. Grace & Co.
   c. Pozzolith R, Master Builders, Inc.
   d. Protard, Prokrete Industries.
   e. Plastiment, Sika Corporation.
   f. Catexol 1000R, Axim Concrete Technologies.
J. Prohibited Admixture: Calcium chloride thiocyanates or admixture containing more than 0.05 percent chloride ions.

2.4 RELATED MATERIALS

A. Reglets: Where sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 0.0217-inch-thick (26-gage) galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.

B. Dovetail Anchor Slots: Hot-dip galvanized sheet steel, not less than 0.0336 inch thick (22 gage) with bent tab anchors. Fill slot with temporary filler or cover face opening to prevent intrusion of concrete or debris.

C. Premolded Interior Joint Filler: Non-asphaltic, wood, or vegetable fiber.

D. Premolded Exterior Joint Filler: Asphalt impregnated or non-asphaltic mineral or vegetable fiber.

E. Expansion Joint Filler: Open celled, vulcanized elastomeric, polyvinyl chloride seal strip.

F. Crushed Stone (#57): Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand, ASTM D 2940, with at least 95 percent passing a 1-1/2 inch sieve and not more than 8 percent passing a No. 200 sieve.

J. Vapor Barrier: Provide vapor barrier that is resistant to deterioration when tested according to ASTM E 154, as follows:

1. Polyethylene sheet not less than 8 mils thick.
2. Water-resistant barrier consisting of heavy kraft papers laminated together with glass-fiber reinforcement and overcoated with black polyethylene on each side.
   a. Product: Subject to compliance with requirements, provide Moistop by For-tifiber Corporation.

K. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

L. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene-coated burlap.

M. Liquid Membrane-Forming Curing Compound – Interior Concealed Slabs: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg/sq. meter when applied at 200 sq. ft./gal.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   b. Spartan-Cote, The Burke Co.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
   a. Ashford Formula, Curecrete Chemical Co., Inc. or approved equivalent.

O. Water-Based Acrylic Membrane Curing Compound: ASTM C 309, Type I, Class B.

1. Provide material that has a maximum volatile organic compound (VOC) rating not to exceed those allowable by jurisdictional regulations.

2. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   b. SeaCo - VOC, Cormix Construction Chemicals.
   c. Safe Cure and Seal, Dayton Superior Corp.
   d. Aqua-Cure, Euclid Chemical Co.
   e. Dress & Seal WB, L&M Construction Chemicals, Inc.
   f. Masterkure 100W, Master Builders, Inc.
   g. Vocomp-20, W.R. Meadows, Inc.
   h. Metcure, Metalcrete Industries.
   i. Stontop CS1, Stonhard, Inc.

P. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   b. Eucobar, Euclid Chemical Co.
   c. E-Con, L&M Construction Chemicals, Inc.
   d. Confilm, Master Builders, Inc.
   e. Waterhold, Metalcrete Industries.

Q. Underlayment Compound: Free-flowing, self-leveling, pumpable, cement-based compound for applications from 1 inch thick to feathered edges.
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

d. Corlevel, Cormix Construction Chemicals.
e. LevelLayer II, Dayton Superior Corp.
f. Flo-Top, Euclid Chemical Co.
g. Gyp-Crete, Gyp-Crete Corp.
h. Levelex, L&M Construction Chemicals, Inc.
i. Underlayment 110, Master Builders, Inc.
j. Stoncrete UL1, Stonhard, Inc.
k. Concrete Top, Symons Corp.
l. Thoro Underlayment Self-Leveling, Thoro System Products.

R. Bonding Agent: Polyvinyl acetate or acrylic base.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

a. Polyvinyl Acetate (Interior Only):
   1) Superior Concrete Bonder, Dayton Superior Corp.
   2) Euco Weld, Euclid Chemical Co.
   3) Weld-Crete, Larsen Products Corp.
   4) Everweld, L&M Construction Chemicals, Inc.
   5) Herculox, Metalcrete Industries.
   6) Ready Bond, Symons Corp.

b. Acrylic or Styrene Butadiene:
   1) Acrylic Bondcrete, The Burke Co.
   2) Strongbond, Conspec Marketing and Mfg. Co.
   3) Day-Chem Ad Bond, Dayton Superior Corp.
   4) SBR Latex, Euclid Chemical Co.
   6) Hornweld, A.C. Horn, Inc.
   7) Everbond, L&M Construction Chemicals, Inc.
   8) Acryl-Set, Master Builders Inc.
   9) Intralok, W.R. Meadows, Inc.
   10) Acrylpave, Metalcrete Industries.
   11) Sonocrete, Sonneborn-Chemrex.
   12) Stonlock LB2, Stonhard, Inc.
   13) Strong Bond, Symons Corp.

S. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

a. Burke Epoxy M.V., The Burke Co.
b. Spec-Bond 100, Conspec Marketing and Mfg. Co.
c. Resi-Bond (J-58), Dayton Superior.
d. Euco Epoxy System #452 or #620, Euclid Chemical Co.
e. Epoxitite Binder 2390, A.C. Horn, Inc.
f. Epabond, L&M Construction Chemicals, Inc.
g. Conresive Standard Liquid, Master Builders, Inc.
h. Rezi-Weld 1000, W.R. Meadows, Inc.
i. Metco Hi-Mod Epoxy, Metalcrete Industries.
j. Sikadur 32 Hi-Mod, Sika Corp.
k. Stonset LV5, Stonhard, Inc.
l. R-600 Series, Symons Corp.

T. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, non-staining grout containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application, and a 30-minute working time.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
   a. NS Grout, The Euclid Company.
   c. Masterflow 713, Master Builders.
   d. Sikaglout 212, SIKA.

2.5 PROPORTIONING AND DESIGNING MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Architect for preparing and reporting proposed mix designs. Trial batch and field experience tests shall have been performed within 12 months of submittal date. Use mix design submittal form included at the end of this section.

1. Do not use the same testing agency for field quality control testing.
2. Limit use of fly ash to not exceed 25 percent of cement content by weight.

B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Architect. The approved mix designs shall be used throughout this project unless changes are approved by the Architect/Engineer prior to use.

C. The specified compressive strengths (f'c) of the concrete for each portion of the Structure and minimum cement content shall be as follows:

<table>
<thead>
<tr>
<th>CLASS</th>
<th>WHERE USED</th>
<th>REQUIRED 28-DAY STRENGTH</th>
<th>MINIMUM CEMENT CONTENT-POUNDS PER CUBIC YARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Footings and insulated walls (ICF)</td>
<td>3,000 psi</td>
<td>470</td>
</tr>
<tr>
<td>III</td>
<td>Interior slabs on grade</td>
<td>4,000 psi</td>
<td>550</td>
</tr>
</tbody>
</table>
IV Exterior and other concrete exposed to weather 4,500 psi (max. w/c=.45) 564

With an approved water-reducing agent, minimum cement content may be reduced by 47 pounds of cement.

D. Water/Cement Ratio: All concrete subject to freezing and thawing shall have a maximum water/cement ratio of 0.50 (4000 psi at 28 days or more). All concrete subjected to de-icers and/or required to be watertight shall have a maximum water/cement ratio of 0.45 (4500 psi at 28 days or more). All reinforced concrete subjected to brackish water, salt spray, or de-icers shall have a maximum water/cement ratio of 0.40 (5000 psi at 28 days or more). All trowel finished interior slabs, subjected to vehicular traffic, shall have a maximum w/c ratio of 0.48.

E. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches after adding admixture to site-verified 2-to-3-inch slump concrete.
4. Other concrete: Not more than 4 inches.

F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

2.6 ADMIXTURES

A. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

B. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F.

C. Use water-reducing admixture or high-range water-reducing admixture in pumped concrete, architectural concrete, and concrete required to be watertight.

D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1 1/2 percent within the following limits:

1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure:
   a. 5.5 percent for 1 1/2-inch maximum aggregate
   b. 6.0 percent for 1-inch maximum aggregate.
   c. 6.0 percent for 3/4-inch maximum aggregate.
d. 7.0 percent for 1/2-inch maximum aggregate.

2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.

E. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer’s directions.

F. Use admixtures for corrosion inhibitors in strict compliance with manufacturer’s directions.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.

1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - PRODUCTS

3.1 GENERAL

A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.

3.2 FORMS

A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:

1. Provide Class A tolerances for concrete surfaces exposed to view.
2. Provide Class C tolerances for other concrete surfaces.

B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.

D. Provide temporary openings for clean-outs and inspections where interior area of formwork is inaccessible before and during concrete placement. Securely brace
temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.

E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.3 VAPOR BARRIER INSTALLATION

A. General: Place vapor barrier sheeting in position with longest dimension parallel with direction of pour.

B. Lap joints 6 inches and seal with manufacturer's recommended mastic or pressure-sensitive tape.

3.4 PLACING REINFORCEMENT

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as specified.

1. Avoiding cutting or puncturing vapor barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.

B. Deliver reinforcement to job site bundled, tagged and marked. Use waterproof tags indicating bar size, length, and mark corresponding to placing drawings.

C. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.

D. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.

E. Place reinforcement to maintain minimum coverages as indicated for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

F. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

G. Welding of reinforcing bars will not be permitted without approval of the Architect/Engineer.
H. When permitted, field bend bars cold, except during cold weather when moderate heating is necessary to avoid brittle failures.

3.5 JOINTS

A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect.

B. Provide keyways at least 1 1/2 inches deep in construction joints in walls and slabs and between walls and footings. Bulkheads designed and accepted for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.

D. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

E. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

   1. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."
   2. Hold top of premolded filler material down 1/2" from top of slab.
   3. At locations where drawings do not specifically call for premolded filler, provide bond breaker between slab and vertical surface. The vapor barrier may be turned up and used for this purpose.

F. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth or inserts 1/4 inch wide by one-fourth of slab depth, unless otherwise indicated.

   1. Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
   2. Contraction joints may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
   3. Soft cut method may be used immediately after final finishing.
   4. If joint pattern is not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
   5. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."

3.6 INSTALLING EMBEDDED ITEMS

A. General: Set and build into formwork anchorage devices, anchor bolts, and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.

B. Aluminum conduit shall not be installed in concrete.
C. 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, relieving angles, and other conditions.

D. Install dovetail anchor slots in concrete structures as indicated on drawings.

E. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.7 PREPARING FORM SURFACES

A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.

B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.

1. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

3.8 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified. Concrete delivery tickets shall show:

1. Batch number.
2. Mix by number with cement content in pounds and maximum size aggregate.
3. Admixtures.
4. Air content.
5. Slump.
6. Time dispatched and discharged.
7. Date.
8. Contractor.
9. Ready Mix Supplier.
10. Project Name and Address.
11. Volume of Concrete.

C. If any water is added to the mix on the job, it must be approved by the Architect's representative and delivery ticket noted with the amount of water and signed by the Architect's representative. The maximum water/cement ratio of an approved mix design may not be exceeded.

D. Discharge concrete within 1 1/2 hours after water has been added to the cement, unless a longer time has been authorized by the Architect/Engineer. During hot weather or other conditions contributing to a quick stiffening of the concrete, the Architect/Engineer may require discharge in less than 1 1/2 hours.
E. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.

F. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints. Do not allow concrete to drop more than five feet.

1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.

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 machine. 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 set. 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 to segregate.

G. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.

1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.

2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

3. Maintain reinforcing in proper position on chairs during concrete placement.

H. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

I. 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 90 deg F at point of placement.

1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

J. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F (32 deg C). Mixing water may be chilled 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 reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Architect.
5. Pumping Concrete: Grout used to prime a pump shall not be placed in the forms of any concrete exposed to view in the final structure.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

C. 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.

3.10 MONOLITHIC SLAB FINISHES

A. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and where indicated.

1. After placing slabs, finish surface to tolerances of F (F) 15 (floor flatness) and F (L) 13 (floor levelness) measured according to ASTM E 1155. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and where indicated.

1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F (F) 18 (floor flatness) and F (L) 15 (floor levelness) measured according to ASTM E 1155. Cut down high spots and fill
low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or another thin film-finish coating system.

1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through applied floor covering system.

D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply a trowel finish as specified, then immediately follow by slightly scarifying the surface with a fine broom.

E. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen concrete 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 for passage of work by other trades, unless otherwise shown or directed, 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 shown or required to complete Work.

3.12 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days. Avoid rapid drying at end of curing period.

C. Curing Methods: Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified.

D. Provide moisture curing by the following methods:

1. Keep concrete surface continuously wet by covering with water.
2. Use continuous water-fog spray.
3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide
coverage of concrete surfaces and edges, with a 4-inch lap over adjacent absorptive covers.

4. Moisture cure interior and exterior concrete exposed to deicing salts.

E. Provide moisture-retaining cover curing as follows:

1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practical width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

F. Apply curing compound on exposed interior slabs and curbs as follows:

1. Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to manufacturer’s directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

3. Just prior to Substantial Completion of Project, apply an additional coat of the “Liquid Membrane-Forming Curing Compound” specified to all exposed to view concrete floor slabs.

G. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

H. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by applying the appropriate curing method.

1. Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.

I. All freshly placed concrete shall be kept from freezing for a period of at least three days after it is placed. A cumulative curing time of seven days at a minimum surface temperature of 50 degrees F (10°C) shall be provided until concrete has attained 75% of its design strength. This shall be followed by cooling of concrete in a gradual transition to surrounding conditions. The temperature drop during this period shall not exceed 2 degrees F per hour until the outside or surrounding temperature is reached.


1. When concrete is placed under conditions of cold weather concreting (defined as a period when the mean daily temperature drops below 40 degrees F for more than three successive days), take additional precautions as specified in "Cold Weather Concreting" by the American Concrete Institute (ACI Report 306) when placing, curing, monitoring and protecting the fresh concrete.
K. Hot Weather Concreting ("Hot Weather Concreting" by the American Concrete Institute Committee 305).

1. When concrete is placed under conditions of hot weather concreting, provide extra protection of the concrete against excessive placement temperatures and excessive drying throughout the placing and curing operations. Hot weather is defined as air temperature which exceeds 80 degrees F or any combination of high temperature, low humidity and/or high wind velocity which causes a rate of evaporation in excess of 0.2 pounds per square foot per hour as determined by Figure 2.1.5 of ACI Report 305. Hot weather curing is required if these conditions occur within a 24 hour period after completion of concrete placement.

2. Forms, reinforcing and the air shall be cooled by water fog spraying immediately before placing concrete. The placement temperature of the concrete shall be 75 degrees to 90 degrees F.

3. Immediately following screeding, protect concrete by applying the specified evaporation retarder in accordance with the recommendations of the manufacturer.

3.13 REMOVING FORMS

A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

C. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

3.14 REUSING FORMS

A. 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-coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use patched forms for exposed concrete surfaces except as acceptable to Architect.

3.15 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect.
B. Mix dry-pack mortar, consisting of one part portland cement to 2 1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.

1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.

2. For surfaces exposed to view, blend white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas 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.

C. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with bonding agent.

1. Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.

1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate to the reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.

2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.

3. Correct low areas in unformed surfaces 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. Proprietary underlayment compounds may be used when acceptable to Architect.

4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel 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 to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

E. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.
3.16 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. General: Employ a testing agency which meets the requirements of ASTM E329 to perform tests and to submit test reports. The agency will monitor concrete quality by means of site and laboratory tests. They will be authorized to reject plastic concrete not conforming to specifications. They will inform Contractor of inadequacies in concrete quality. Failure to detect any defective materials shall not prevent later rejection when such defect is discovered, or obligate the Architect or Owner for final acceptance.

B. Sampling and testing for quality control during concrete placement shall include the following:

1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

   a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

   b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.

   c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.

   d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.

   e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.

3. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

4. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.

C. Test results will be reported in writing to the Architect, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and
materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

E. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

F. Testing of the F-number tolerances shall be conducted in accordance with the provisions set forth by ASTM Committee E6.21.10. All tests shall be performed within three working days after concrete placement and prior to any form removal. If in-place floor slabs do not comply with the minimum values shown, the Contractor shall propose remedial measures to bring the surfaces of the floors into compliance. These measures might include grinding, planing, surface repair, retopping, or removal and replacement. Remedial measures shall be approved by the Architect prior to the Contractor’s commencement of the work.

PART 4 – MIX DESIGN SUBMITTAL FORM

4.1 Mix Design Submittal Form shall be used for submitting proposed mix design.

END OF SECTION 03300
CONCRETE MIX DESIGN SUBMITTAL FORM

Project: __________________________________________________________
City, State: ______________________________________________________
General Contractor: ________________________________________________
Concrete Contractor: ______________________________________________
Mix Design Number: ________________________________________________
Concrete Strength (class): __________________________________________
Use (describe): ____________________________________________________

Design Mix Information

Based on Standard Deviation Analysis [ ]
Based on Trial Mix Laboratory Test Data [ ]

Design Characteristics

Density [ ] pcf
Strength [ ] psi (28 days)
Air [ ] %
Slump [ ] inches

If trial mixes are used, the Mix Design is proportioned to achieve $f'cr = f_c + 1200 \text{ psi}$
(1400 psi for strength higher than 5000 psi at 28 days)

Materials

<table>
<thead>
<tr>
<th>Type</th>
<th>Source</th>
<th>Specific Gravity</th>
<th>Weight (lb.)</th>
<th>Absolute Vol. (cu. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flyash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silica fume</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coarse aggregate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine aggregate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>27.0</td>
<td></td>
</tr>
</tbody>
</table>

Water/Cementitious Ratio (W/C) = _________% (lbs. cementitious/lbs. water)
Admixtures

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Dosage (oz./cwt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water reducer</td>
<td></td>
</tr>
<tr>
<td>Air entraining agent</td>
<td></td>
</tr>
<tr>
<td>High range water reducer</td>
<td></td>
</tr>
<tr>
<td>Non-corrosive accelerator</td>
<td></td>
</tr>
<tr>
<td>Other (</td>
<td></td>
</tr>
</tbody>
</table>

Slump before high range water reducer = ________ inches
Slump after high range water reducer = ________ inches

Standard Deviation Analysis (field experience records)

Number of test cylinders evaluated: _____ Standard deviation: ______
Required average compressive strength: _______ Actual: ________

(refer to ACI 301 for standard deviation calculation – attach copies of laboratory test reports)

Trial Mix Laboratory Test Data

<table>
<thead>
<tr>
<th>Age</th>
<th>Mix #1</th>
<th>Mix #2</th>
<th>Mix #3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Date</td>
<td>Comp. Strength</td>
<td>Date</td>
</tr>
<tr>
<td>7 days</td>
<td>psi</td>
<td>psi</td>
<td>psi</td>
</tr>
<tr>
<td>7 days</td>
<td>psi</td>
<td>psi</td>
<td>psi</td>
</tr>
<tr>
<td>28 days</td>
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<td>psi</td>
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<tr>
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</tr>
<tr>
<td>28 days</td>
<td>psi</td>
<td>psi</td>
<td>psi</td>
</tr>
<tr>
<td>average</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

(refer to ACI 301 for trial mix procedure – attach copies of laboratory test reports)

Required attachments

Please check

Coarse aggregate gradation report
Fine aggregate gradation report
Laboratory test reports (strength tests)
Admixture compatibility certification letters

Ready Mix Supplier

Name and Address: __________________________________________________________

Phone: ___________________ Miles from project: _______ Date: __________
SECTION 05100 - STRUCTURAL METAL FRAMING

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division I Specification sections, apply to work of this section.

B. Requirements of non-shrink grout of this section are as listed in Division 3, Section - "Concrete Work".

1.2 DESCRIPTION OF WORK

A. Extent of structural steel work is shown on drawings, including schedules, notes and details to show size and location of members, typical connections, and type of steel required.

B. Structural steel is that work defined in AISC "Code of Standard Practice" and as otherwise shown on drawings.

C. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in mill, shop and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

1. Promptly remove and replace materials or fabricated components which do not comply.

D. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.

1. Promptly notify Engineer whenever design of members and connections for any portion of structure are not clearly indicated.

E. Miscellaneous Metal Fabrications are specified elsewhere in Division 5.
1. Refer to Division 3 for anchor bolt installation in Concrete; Division 4 for Masonry.

1.3 SUBMITTALS

A. Product Data: (When requested by the Engineer) submit producer's or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.

2. High-strength bolts (each type), including nuts and washers.

3. Structural steel primer paint.

B. Shop Drawings, General: All shop drawings submitted shall be a complete set of original drawings created by the Supplier. No partial or incomplete submittals nor duplication of Engineer's original documents will be permitted.

1. All shop drawing submittals shall include 2 sets of prints and 1 sepia for structural consultant to review and mark up. (Note number of prints may be increased by Architect/Engineer at the Preconstruction Conference.)

2. Shop drawings must not only bear the Contractor's stamp of approval but shall also show evidence that each item has been thoroughly checked. Failure to comply with this requirement shall result in the Engineer's return of the submission (without review or action) for the Contractor's proper submission and review. No exceptions shall be taken.

3. The Engineer has set aside time to examine shop drawings one time only and to briefly reexamine a resubmission one time. Should it be required that shop drawings or product data be reviewed again, the Contractor shall reimburse the Engineer at the cost of 3.25 times the hourly rate of the Engineer's personnel to reexamine them.

4. Copies of shop drawings used in the field shall bear the Engineer's review stamp with items checked to indicate a satisfactory final review.
C. Shop Drawings, Structural Steel: Submit shop drawings prepared under supervision of an experienced steel detailer with a minimum experience history of five years, with at least two years in similar type buildings. Shop drawings should include complete details and schedules for fabrication and assembly of structural steel member procedures and diagrams. Note that any connection changes or additions must be prepared under the supervision of a registered engineer. **At time of bid, submit chief detailer's name and list of two years of major projects.**

D. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of tests conducted and test results.

### 1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:

1. AISC "Code of Standard Practice for Steel Buildings and Bridges".

2. Paragraph 4.2.1 of the above code is hereby modified by deletion of the following sentence: "This approval constitutes the owner's acceptance of all responsibility for the design adequacy of any detail configuration of connections developed by the fabricator as part of his preparation of these shop drawings."


5. ANSI/AWS D1.1 "Structural Welding Code -- Steel".

6. ASTM A 6 "General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use".
B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".

1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.

   a. If recertification of welders is required, retesting will be Contractor's responsibility.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site at such intervals to insure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.

   1. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART II - PRODUCTS

2.1 MATERIALS

A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.

B. Structural Steel Shapes, Plates and Bars: ASTM A 36.

C. Cold-Formed Steel Tubing: ASTM A 500, Grade B.

E. Anchor Bolts: ASTM A 307, nonheaded type unless otherwise indicated.

   1. Provide either hexagonal or square, heads and nuts.

G. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:
   1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A 325-N bearing type.
   2. Direct tension indicator washers or bolts may be used at Contractor's option with Engineer's prior approval.

   1. For high-strength low-alloy steel, provide electrodes, welding rods and filler metals equal in strength and compatible in appearance with parent metal joined.

I. Structural Steel Primer Paint:
   1. SSPC-Paint 15, Type I, red oxide. (Fabricator to verify this system is "VOC-compliant" for his location).

2.2 FABRICATION

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Connect base plates to columns in the shop unless indicated otherwise.
   1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
2. Where an exposed finish is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

B. Connections: Beam connections shall be as detailed. If connection is not indicated they shall be designed in accordance with AISC Manual of Steel Construction, Allowable Stress Design, Ninth Edition, Part 4 'Connections'. The connection shall support a reaction equal to one-half the total uniform load capacity for the slope, span and specifications of the particular beam as calculated using the tables for "Allowable Uniform Loads in kips for beams laterally supported" as found in the above listed AISC Manual in the Section "Allowable Loads on Beams" in Part 2 "Beam and Girder Design".

1. Weld or bolt shop connections, as indicated. Use welded connections if not indicated.

2. Bolt field connections, except where welded connections or other connections are indicated.

   a) Provide high-strength threaded fasteners in bearing type connections for all bolted connections, except where erection or unfinished bolts are indicated.

C. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A 325-N Bolts."

D. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.

   1. Assemble and weld built-up sections by methods which will produce true alignment or axes without warp.

   2. For high-strength low-alloy steels, follow welding procedures as recommended by steel producer for exposed and concealed connections.

E. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Field weld shear connectors, spaced as shown, to beams and girders in
composite construction. Use automatic end welding of headed stud shear connectors in accordance with manufacturer's printed instructions.

F. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.

1. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work.

2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

G. Expansion Joints: Unless otherwise indicated, provide expansion joints in steel shelf angles; locate steel angle joints at vertical brick expansion joints as indicated on the drawings.

2.3 SHOP PAINTING

A. General: Shop paint structural steel, except exterior, exposed members (which are to be galvanized, embedded in concrete or mortar, or finish painted). Field paint any portion of steel that is embedded below grade or lowest finish floor with one coat of a two component high density, high solids barrier epoxy over shop primer, after erection. Epoxy to be Interzone 954 by International Protective Coatings, a Division of Porter Paints, or approved equal. Minimum thickness is 20 mils DFT.

1. Do not paint surfaces (which are to be field welded, which are to receive shear studs), or high-strength bolted with friction-type connections.

2. Apply 2 coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

3. Galvanizing: Unless otherwise specified, protect angle lintels, exposed steel, [anchors, rolled, pressed and forged shapes, plates, bars and strips 1/8" thick or heavier] by galvanizing in conformance with ASTM A 153 and ASTM A 123.
B. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) as follows:

1. SP-2 "Hand Tool Cleaning" (for red-oxide primer).
2. SP-6 "Commercial Blast Cleaning" after SP-1 "Solvent Cleaning" (for zinc-rich primer).
3. SP-7 "Brush Off Blast Cleaning" (for galvanized surfaces).

C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 1.5 mils. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces. Protected or enclosed steel to receive ordinary paint. Steel exposed to weather (including lintels) which are not galvanized are to receive zinc-rich primer.

PART 3 - EXECUTION

3.1 ERECTION

A. Surveys: Employ a registered professional engineer or land surveyor for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect/Engineer. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Architect/Engineer.

B. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

C. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.
1. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.
   
   a. Refer to Division 3 of these specifications for anchor bolt installation requirements in concrete.

D. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.

   1. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices. Leveling plates will not be accepted.

   2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

   3. Pack grout solidly between bearing surfaces and base plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

   a. For proprietary grout materials, comply with manufacturer's instructions.

E. After erection of columns and installation of grout, coat all exposed steel below finished floor elevation with one coat of a two component high density, high solids barrier epoxy over shop primer, after erection. Epoxy to be Interzone 954 by International Protective Coatings, a Division of Porter Paints, or approved equal. Minimum thickness is 20 mils DFT.

F. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

   1. Level and plumb individual members of structure within specified AISC tolerances.
2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

3. Splice members only where indicated and accepted on shop drawings.

G. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.

H. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

1. Do not enlarge unfair holes in members by burning or by use of drift pins. Ream holes that must be enlarged to admit bolts.

I. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress, only upon written approval by the Engineer. Finish gas-cut sections equal to a sheared appearance when permitted.

J. Touch-up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same materials as used for shop painting. Apply by brush or spray to provide minimum dry film thickness of 2.0 mils.

K. For Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

3.2 QUALITY CONTROL

A. The Contractor will engage an independent testing and inspection agency approved by the Engineer to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports.

1. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
2. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.

3. Testing agency may/must inspect structural steel at plant before shipment; however, Engineer reserves right, at any time before final acceptance, to reject material not complying with specified requirements.

B. Correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.

C. Shop Bolted Connections: Inspect in accordance with AISC specifications.

D. Field Bolted Connections: Inspect in accordance with AISC specifications.

E. All Field Welding except Composite Studs: Inspect and test during erection of structural steel as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. Perform visual inspection of all welds. Record weld size, length, dimensions of connecting plates, as well as relative weld quality: Unacceptable, Borderline - needs more testing, or Acceptable. A chart should be made showing the above, plus exact location, date, inspector, remarks, and any follow up work where required.

3. Perform tests on 25 percent of welds as directed by the Engineer, as follows:

   a) Liquid Penetrant Inspection: ASTM E 165

   b) Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.
c) Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2-2T".

d) Ultrasonic Inspection: ASTM E 164.

END SECTION
SECTION 06100 - 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.

B. Related Sections;
   1. Division 6 “Finish Carpentry” and “Interior Architectural Woodwork.”

1.2 SUMMARY

A. This Section includes the following:

   1. Wood furring, grounds, nailers, and blocking.
   2. Structural use panels.
   3. Interior frame walls.
   4. Dimensional structural lumber

1.3 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise specified.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. 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 American Lumber Standards Committee's (ALSC) Board of Review.

C. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:

   1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
2. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Wood-Preservative-Treated Materials:
   b. Chemical Specialties, Inc.
   c. Continental Wood Preservers, Inc.
   d. Hickson Corp.
   e. Hoover Treated Wood Products, Inc.
   f. Osmose Wood Preserving, Inc.

2.2 LUMBER, GENERAL


B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:

1. NELMA - Northeastern Lumber Manufacturers Association.
2. NLGA - National Lumber Grades Authority (Canadian).
3. RIS - Redwood Inspection Service.
4. SPIB - Southern Pine Inspection Bureau.
C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

D. 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.
   1. Provide dressed lumber, S4S, unless otherwise indicated.
   2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
   1. Do not use chemicals containing chromium or arsenic.

B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:
   1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

C. Pressure treat wood members in contact with ground or freshwater with waterborne preservatives to a minimum retention of 0.40 lb/cu. ft. (6.4 kg/cu. m).

D. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

2.4 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

B. Non-Load-Bearing Interior Partitions: Provide framing of the following grade and species:
   1. Grade: Standard, Stud, or No. 3.
   2. Species: Eastern softwoods; NELMA.
   3. Species: Spruce-pine-fir south; NELMA.
   4. Species: Southern pine; SPIB.

2.5 MISCELLANEOUS LUMBER
A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA of any species.

2.6 WOOD-BASED STRUCTURAL-USE PANELS, GENERAL
A. Structural-Use Panel Standard: Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood."

B. Trademark: Factory mark structural-use panels with APA trademark evidencing compliance with grade requirements.

2.7 STRUCTURAL-USE PANELS FOR BACKING
A. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant-treated plywood panels with grade, C-D Plugged Exposure 1, in thickness indicated or, if not otherwise indicated, not less than 15/32 inch (11.9 mm) thick.

2.8 FASTENERS
A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.


C. Power-Driven Fasteners: CABO NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M)
2.9 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.

C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. CABO NER-272 for power-driven staples, P-nails, and allied fasteners.

F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. 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; predrill as required.

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for
screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

C. Install permanent grounds of dressed, preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 INSTALLATION OF STRUCTURAL-USE PANELS


B. Fastening Methods: Fasten panels as indicated below:
   1. Plywood Backing Panels: Nail or screw to supports.

END OF SECTION 06100
SECTION 06105 - MISCELLANEOUS 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. This Section includes the following:
   1. Wood furring, grounds, nailers, and blocking.
   2. Sheathing.

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:

   1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
   2. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.
   3. For fire-retardant-treated wood products, include certification by treating plant that treated materials comply with specified standard and other requirements as well as data relative to bending strength, stiffness, and fastener-holding capacities of treated materials.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

   1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS
2.1 LUMBER, GENERAL


B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
   1. NELMA - Northeastern Lumber Manufacturers Association.
   2. SPIB - Southern Pine Inspection Bureau.
   3. WWPA - Western Wood Products Association.

C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
   1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece.

D. 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.
   1. Provide dressed lumber, S4S, unless otherwise indicated.
   2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
   1. Do not use chemicals containing chromium or arsenic.

B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:
   1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
   2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
C. Pressure treat wood members in contact with ground or freshwater with waterborne preservatives to a minimum retention of 0.40 lb/cu. ft. (6.4 kg/cu. m).

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated wood is indicated, comply with applicable requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL; U.S. Testing; Timber Products Inspection, Inc.; or another testing and insulating agency acceptable to authorities having jurisdiction.

1. Treatment Type: Interior Type A.

B. Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.

2.4 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture Content: 19 percent maximum for lumber items are not specified to receive wood preservative treatment.

D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.5 WOOD-BASED STRUCTURAL-USE PANELS

A. Structural-Use Panel Standards: Provide either all-veneer, mat-formed, or composite panels complying with DOC PS 2, "Performance Standard for Wood-Based Structural-Use Panels," unless otherwise indicated. Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood," where plywood is indicated.

B. Trademark: Factory mark structural-use panels with APA trademark evidencing compliance with grade requirements.

C. Miscellaneous Concealed Plywood: C-C Plugged Exterior, thickness as indicated but not less than 1/2 inch (12.7 mm).
D. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant-treated plywood panels with grade, C-D Plugged Exposure 1, in thickness indicated or, if not otherwise indicated, not less than 15/32 inch (11.9 mm) thick.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where miscellaneous carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.

C. Power-Driven Fasteners: CABO NER-272.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
C. Fit carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
E. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.
F. Use fasteners of appropriate type and length. Predrill members when necessary to avoid splitting wood.

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

A. Install where shown and where required for screeding or attaching other work. Cut and shape to required size. Coordinate locations with other work involved.
B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 INSTALLATION OF STRUCTURAL-USE PANELS


END OF SECTION 06105
SECTION 06120 – STRUCTURAL INSULATED PANELS

Part 1 General

Submittals:
Product Data: submit manufacturer’s product literature and installation details for structural insulated panels.

Shop Drawings: Submit shop drawings showing layout of panels and details of special and typical conditions. Drawings to show connection details and sealing details.

DELIVERY, STORAGE AND HANDLING

General Protection: Protect panels from physical damage and from becoming wet, soiled, or covered with ice or snow by tarpaulins once delivered to the job site.

Drawings and specifications are based on FischerSIPS® Panels manufactured by FischerSIPS®, LLC from its headquarters and production facilities in Louisville, KY (1-800-792-7477) or (502-778-5577)

STRUCTURAL INSULATED PANELS

General: Provide panels which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics. A listing on NER-467 is required or Manufacturer to submit letter from licensed professional structural engineer or architect in the state where the project is located stating panels comply with BOCA, SBCCI, ICBO & CABO Building Codes and submit stamped span tables applicable to the project from Professor George Thomas Bible, Professional Engineer in the State of Ohio (E-45314).

Structural Insulated Panels, sometimes referred to as stress-skin panels, are made of two layers of plywood or OSB sheathing (typically 7/16”) adhered to an inner layer of EPS (Expanded Polystyrene Foam) with glue and set under pressure. Panels are fabricated within FischerSIPS licensed factories under 3rd party testing and carry a Limited Lifetime Warranty.

Expanded Polystyrene Insulation (EPS): Rigid, cellular thermal insulation made to comply with ASTM C578, Type I, .95 lb.cu ft. Minimum Density, aged R-Value of 4.0 and 3.6 at 40 and 75 degrees F, respectively.
Composite Board: Provide minimum 7/16” oriented strand board (OSB) with Exposure 1, PS2 minimum rating laminated to both sides of the EPS insulation.

Auxiliary Materials: Spline materials to be SPF#2 unless otherwise noted by FischerSIPS, llc. Fasteners and sealants to be of size and type as recommended by FischerSIPS, for type of application and condition of substrate.

Part 3 Execution

**INSPECTION AND PREPARATION**

Installer shall examine substrates and conditions under which panel work is to be performed. A satisfactory substrate is one that complies with the requirements of the section in which substrate and related work is specified. Obtain Installer’s written report listing conditions detrimental to performance of work in the section. Do not proceed with installation of panels until unsatisfactory conditions have been corrected.

**INSTALLATION GENERAL**

Comply with FischerSIPS instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer’s technical representative for specific recommendations before proceeding with work.

Install panels, complying with FischerSIPS, LLC recommendations and approved shop drawings. A representative from FischerSIPS, LLC will visit the job site during the panel erection for inspection and technical support.

**PRODUCTS AVAILABLE**

Panels in standard sizes ranging from 4’x8’ up to 8’x 24’ (one solid skin). The following EPS foam cores are available: 3 11/16” Core (R-17), 5 11/16” Core (R-25), 7 7/16” Core (R-36), 9 7/16” Core (R-45), 11 ¼” Core (R-54).

**SPAN CAPABILITIES**
FischerSIPS, LLC panels may span up to 24 feet in length. All spans must fall within the criteria expressed in FischerSIPS, LLC. load tables stamped by Tom Bible or NER-467. For questions on load tables, please contact a representative of FischerSIPS, LLC. 800-792-SIPS x285
Panels must receive minimum 1 ½” bearing at each end if used to free span.
SECTION 07210 - INSULATION

1.0 PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

Extent of insulation work is shown on drawings and indicated by provisions of this section.

Applications of insulation specified in this section include the following:

- Blanket-type building insulation.

- Sound Attenuation Insulation is specified in section 09250 Gypsum drywall.

1.3 QUALITY ASSURANCE:

Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by r-values they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

- Surface Burning Characteristics: ASTM E 84.
1.4 **SUBMITTALS:**

**Product Data:** Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.

1.5 **DELIVERY, STORAGE, AND HANDLING:**

**General Protection:** Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

**Protection for Plastic Insulation:**

*Do not expose* to sunlight, except to extent necessary for period of installation and concealment.

Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time.

Complete installation and concealment of plastic materials as rapidly as possible in each area of work.

2.0 **PART 2 - PRODUCTS**

2.1 **ACCEPTABLE MANUFACTURERS:**

**Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

**Manufacturers of Glass Fiber Insulation:**

CertainTeed Corp.
Knauf Fiber Glass GmbH.
Manville Corp.
Owens-Corning Fiberglas Corp.

**Manufacturers of Extruded Polystyrene Board Insulation:**

Amoco Foam Products Co.
Dow Chemical U.S.A.
Minnesota Diversified Products, Inc.
2.2 INSULATING MATERIALS:

2.2.1 General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.

   Preformed Units: Sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths and lengths.

2.2.2 Faced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type III; foil vapor-retarder membrane on one face, respectively; and as follows:

   Mineral Fiber Type: Fibers manufactured from glass or slag.


   Surface Burning Characteristics - Concealed Installations: Maximum flame spread rating of 75 and smoke developed value of 450 per ASTM E84.

   Surface Burning Characteristics - Exposed Installations: (Exposed installations include attics, plenums and crawl spaces). Maximum flame spread rating of 25 and smoke developed value of 450 per ASTM E84.

2.2.3 Extruded Polystyrene Board Insulation: Rigid, cellular thermal insulation with closed-cells and integral high density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578 for Type indicated; with 5-year aged r-values of 5.4 and 5 at 40 and 75 deg. F (4.4 and 23.9 deg C), respectively; and as follows:

   Type IV, 1.6 lb./cu. ft. min. density, unless otherwise indicated.

   Surface Burning Characteristics: Maximum flame spread and smoke developed values of 5 and 165, respectively.

   Thickness: Provide 1-1/2" thick boards unless indicated otherwise.

2.3 AUXILIARY INSULATING MATERIALS:

   Adhesive for Bonding Insulation: Type recommended by insulation manufacturer, and complying with requirements for fire performance characteristics.
**Mechanical Anchors**: Type and size indicated or, if not indicated as recommended by insulation manufacturer for type of application and condition of substrate.

**Mastic Sealer**: Type recommended by insulation manufacturer for bonding edge joints between units and filling voids in work.

### 3.0 PART 3 - EXECUTION

### 3.1 INSPECTION AND PREPARATION:

Require Installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections which might puncture vapor retarders.

### 3.2 INSTALLATION, GENERAL:

Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

Apply insulation of required thickness, unless otherwise shown or required to make up total thickness.

### 3.3 INSTALLATION OF GENERAL BUILDING INSULATION:

Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

Seal joints between closed-cell (non-breathing) insulation units by applying mastic or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with mastic or sealant.
Set vapor retarder faced units with vapor retarder to warm side of construction, except as otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.

Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure air-tight installation.

Stuff loose glass fiber insulation into miscellaneous voids and cavity spaces where shown and as required to provide uninterrupted thermal barrier. Compact to approximately 40% of normal maximum volume (to a density of approximately 2.5 lbs. per cu. ft.).

3.4 PROTECTION:

General: Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by nondelayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION 07200
SECTION 07241 - EXTERIOR INSULATION AND FINISH SYSTEMS - CLASS PB

1.0 PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY:

Extent of exterior insulation and finish systems is indicated on drawings.

Types of exterior insulation and finish system applications in this section include the following:

Applications over gypsum sheathing.

Applications over masonry surfaces.

Masonry substrates behind system are specified in Division-4 Section "Unit Masonry".

Gypsum sheathing behind system for field application to steel studs is specified in section 09253

Sealing joints is specified in this section.

1.3 DEFINITIONS:

Exterior insulation and finish system refers to an exterior assembly composed of an inner layer of thermal insulation board and an outer layer forming the protective finish coating. The assembly is applied to a supporting substrate of construction indicated. Designations below for the class and type of exterior insulation and finish system specified in this section are based on those developed by the Exterior Insulation Manufacturers Association (EIMA).

Class PB Type A designates a polymer-based protective finish coating (Class PB), externally reinforced (Type A).

System in this section refers to Class PB Type A exterior insulation and finish systems.

System manufacturer refers to the manufacturer of the exterior insulation and finish system.

1.4 SYSTEM DESCRIPTION:

Provide system complying with the following performance requirements:

Bond Integrity: Free from bond failure within system components or between system and supporting wall construction, resulting from exposure to fire, wind loads, weather, or other in-service conditions.

Weathertightness: Resistant to water penetration from exterior into system and assemblies behind it or through them into interior of building which results in deterioration of thermal-insulating effectiveness or other degradation of system and assemblies behind system including substrates, supporting wall
construction, and interior finish.

Fire Performance Characteristics: Provide materials and construction which are identical to those tested for the following fire performance characteristics, per test method indicated below, by UL or other testing and inspecting agencies acceptable to authorities having jurisdiction:

Surface Burning Characteristics: Flame spread rating of 25 or less per ASTM E 84 for insulation board and protective finish coats, when each is tested individually.

1.5 SUBMITTALS:

Product Data: Manufacturer's technical data for each component of exterior insulation and finish system.

Samples for Initial Selection Purposes: Manufacturer's standard color charts and small scale samples indicating textural choices available.

Submit sealant manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available.

Samples for Verification Purposes: Samples, 2' square, for each finish, color, and texture indicated; prepare samples using same tools and techniques intended for actual work.

Incorporate within each sample a typical control joint filled with sealant of color indicated or selected.

Installer certificates signed by manufacturer certifying that Installers comply with specified requirements.

Test reports for system from a qualified independent testing laboratory certifying and interpreting test results relative to system's compliance with requirements for fire performance characteristics, bond integrity, and material properties.

Sealant compatibility and test report from sealant manufacturer certifying that materials forming joint substrates of system have been tested for compatibility and adhesion with joint sealants; include sealant manufacturer's interpretation of results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.

1.6 QUALITY ASSURANCE:

Manufacturer Qualifications: Firm regularly engaged in manufacturing products for system indicated and with at least 5 years successful experience in applications similar to that required for this Project.

Installer Qualifications: Engage an Installer that is certified in writing by system manufacturer as qualified for installation of systems indicated.

Single Source Responsibility: Obtain materials for system from either a single manufacturer or from manufacturers approved by the system manufacturer as compatible with other system components.

1.7 DELIVERY, STORAGE, AND HANDLING:

Deliver products in original, unopened packages with manufacturer's labels identifying products legible and intact.

Store materials inside and under cover; keep them dry, protected from the weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, damage from construction traffic and other causes.
Stack insulation board flat and off the ground.

1.8 PROJECT CONDITIONS:

Environmental Conditions: Do not install system when ambient outdoor temperatures are 40 deg F (4 deg C) and falling unless temporary protection and heat is provided to maintain ambient temperatures above 40 deg F (4 deg C) during installation of wet materials and for 24 hours after installation or longer to allow them to become thoroughly dry and weather resistant.

1.9 SEQUENCING AND SCHEDULING:

Sequence installation of system with related work specified in other sections to ensure that wall assemblies, including flashing, trim, and joint sealers, are protected against damage from weather, aging, corrosion, or other causes.

2.0 PART 2 - PRODUCTS

2.1 MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering Class PB Type A systems which may be incorporated in the work include, but are not limited to, the following:

- Arachi/Tech Concepts, Inc.
- Dryvit System, Inc.
- Fuller; H.B. Fuller Co.
- ISPO, Inc.
- PLEKO, Inc.
- Sto Industries, Inc.
- Senergy Inc.

2.2 MATERIALS:

2.2.1 Compatibility: Provide adhesive, board insulation, reinforcing fabrics, base and finish coat materials, sealants, and accessories which are compatible with one another and approved for use by system manufacturer.

2.2.2 Provide colors and texture of protective coating to comply with following requirements:

Provide selection made by Architect from manufacturer's full range of standard colors and textures available for type of finish coat indicated. (Color and Finish shall match the new adjacent Kroger Store E-796 EFIS)

2.2.3 Adhesive for Application of Insulation: System manufacturer's standard formulation designed for indicated use, compatible with substrate and complying with the following requirements:

- Job-mixed formulation of portland cement complying with ASTM C 150, Type 1, and polymer-based adhesive specified for base coat.
- Factory-mixed formulation designed for adhesive attachment of insulation to substrates of type
indicated, as approved by system manufacturer.

Either job-mixed or ready-mixed formulation indicated above.

2.2.4 Molded Polystyrene Board Insulation: Rigid, cellular thermal insulation formed by the expansion of polystyrene resin beads or granules in a closed mold to comply with ASTM C 578 for Type I; aged in block form prior to cutting and shipping by air drying for not less than 6 weeks or by another method approved by system manufacturer and producing equivalent results; 2' x 4' x thickness indicated but not less than the minimum thickness allowed by system manufacturer; and complying with requirements of system manufacturer for corner squareness and other dimensional tolerances.

2.2.5 Reinforcing Fabric: Balanced, alkali-resistant open weave glass fiber fabric treated for compatibility with other system materials; made from continuous multi-end strands with tensile strength of not less than 120 lbs. and 140 lbs. in warp and fill directions, respectively, per ASTM D 1682 and complying with ASTM D 578 and the following requirements:

Weight of Standard Reinforcing Fabric: Not less than 3.75 oz. per sq. yd.

Weight of Heavy Weight Reinforcing Fabric: Not less than 16 oz. per sq. yd.

2.2.6 Base Coat Materials: System manufacturer's standard, job-mixed formulation of portland cement complying with ASTM C 150, Type I, white or natural color; and system manufacturer's standard polymer-based adhesive designed for use indicated.

2.2.7 Finish Coat Materials: System manufacturer's standard mixture complying with the following requirements for material composition and method of combining materials:

Factory-mixed formulation of polymer emulsion admixture, color-fast mineral pigments, sound stone particles, and fillers.

2.2.8 Water: Clean and potable.

2.2.9 Mechanical Fasteners: System manufacturer's standard corrosion-resistant fastener assemblies, complete with system manufacturer's standard washer and shaft attachments, selected for properties of pull-out, tensile, and shear strength required to resist design loads of application indicated, capable of pulling fastener head below surface of insulation board, and of the following description:

For attachment to masonry and concrete substrates provide sheathing dowel in the form of plastic wing-tipped fastener with thermal cap, sized to fit insulation thickness indicated and penetrate substrate to depth required to secure anchorage.

2.3 ELASTOMERIC SEALANTS:

Sealant Products: Provide manufacturer's standard chemically curing, elastomeric sealant which is compatible with joint fillers, joint substrates, and other related materials and complies with requirements of Division-7 section "Joint Sealers" for products corresponding to description indicated below.

Multi-Part Nonsag Urethane Sealant.

Sealant Color: Provide color of exposed sealants to comply with the following requirement:

Match finish coat color of system.
2.4 MIXING:

General: Comply with system manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as approved by system manufacturer. Mix materials in clean containers. Use materials within time period specified by system manufacturer or discard.

3.0 PART 3 - EXECUTION

3.1 EXAMINATION:

Examine substrates, with Installer present, to determine if they are in satisfactory condition for installation of system. Do not proceed with installation of system until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

Protect contiguous work from moisture deterioration and soiling resulting from application of systems. Provide temporary covering and other protection needed to prevent spattering of exterior finish coatings on other work.

Protect system, substrates, and wall construction behind them from inclement weather during installation. Prevent infiltration of moisture behind system and deterioration of substrates.

Substrate Preparation: Prepare and clean substrates to comply with system manufacturer's requirements to obtain optimum bond between substrate and adhesive for insulation.

3.3 INSTALLATION:

General: Comply with system manufacturer's current published instructions for installation of system as applicable to each type of substrate indicated.

Adhesively and mechanically attach insulation to comply with the following requirements:

- Allow adhered insulation to remain undisturbed for period prescribed by system manufacturer but not less than 24 hours, prior to beginning rasping and sanding insulation or application of base coat and reinforcing fabric.

- Apply boards over dry substrates in courses with long edges oriented horizontally; begin first course from a level base line and work upwards.

- Stagger vertical joints in successive courses to produce running bond pattern.

- Offset joints of insulation from joints in sheathing.

- Interlock ends at internal and external corners.

- Abut boards tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between insulation boards. If gaps occur, fill with insulation cut to fit gaps exactly; insert without use of adhesive.

- Rasp or sand flush any irregularities projecting more than 1/32" from surface of insulation; do not create depressions deeper than 1/16".
Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes conforming to details indicated.

Interrupt insulation where expansion joints are indicated in substrates behind exterior insulation and finish systems.

Form joints for sealant application by leaving gaps of width needed between adjoining insulation edges as well as between insulation edges and dissimilar adjoining surfaces projecting through insulation that produce joint widths indicated after encapsulation of joint substrates with base coat, reinforcing fabric, and finish coat.

Treat exposed edges of insulation board, including those forming substrates of sealed joints within system or between system and other work, by encapsulating with base coat, reinforcing fabric, and finish coat.

Coordinate flashing installation with installation of insulation to produce a wall system which does not allow water to penetrate behind protective coating.

Apply base coat to exposed surfaces of insulation in minimum thickness specified by system manufacturer.

Fully embed reinforcing fabric of weight indicated below in wet base coat to produce wrinkle-free installation with fabric continuous at corners and lapped or otherwise treated at joints to comply with system manufacturer's requirements.

Fabric Weight: Standard, except at corners and edges, use heavy.

Apply finish coat over dry base coat in thickness required by system manufacturer to produce a uniform finish of texture and color matching approved sample.

3.4 INSTALLATION OF JOINT SEALANTS:

Prepare joints and apply sealants, of type and at locations indicated, to comply with applicable requirements of Division-7 section "Joint Sealers".

3.5 CLEANING AND PROTECTION:

Remove temporary covering and protection of other work. Promptly remove protective coatings from window and door frames, and any other surfaces outside areas indicated to receive protective coating.

Provide final protection and maintain conditions, in a manner acceptable to Installer and system manufacturer, which ensures system being without damage or deterioration at time of Substantial Completion.
SECTION 07460 FIBER CEMENT SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Siding panels.
B. Soffit panels.
C. Accessories and trim.

1.2 RELATED SECTIONS

A. Section 06100 - Rough Carpentry: Framing and Sheathing.
B. Section 07900 - Joint Sealers.
C. Section 09900 - Paints and Coatings: Field painting.

1.3 REFERENCES


1.4 SUBMITTALS

A. Make submittals under provisions of Section 01300.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods, including nailing patterns.
   4. Applicable model code authority evaluation report (ICBO, BOCA, CCMC, etc.)
C. Siding manufacturer's requirements for vapor retarders, primer, paint, etc., to be installed others.
D. Maintenance and periodic inspection recommendations.

1.5 QUALITY ASSURANCE

A. Installer: Provide installer with not less than three years of experience with products similar to those specified.

1.6 DELIVERY, STORAGE, AND HANDLING
A. Store products off the ground, on a flat surface, and under a roof or separate waterproof covering.

1.7 WARRANTY

A. Register manufacturer’s warranty, made out in Owner’s name, with copy to Owner.

PART 2 PRODUCTS

2.1 MANUFACTURER


James Hardie  http://www.jameshardie.com/

Cemplank Siding  http://www.cemplank.com/cemplank.html

2.2 PANELS

A. Fiber Cement Board Panels - General: Cement and cellulose fiber formed under high pressure into boards with integral surface texture; complying with ASTM C 1186 Type A Grade II; machined edges; for nail attachment.

1. Surface Burning Characteristics: Flame spread index of 0, smoke developed index 6, maximum; when tested in accordance with ASTM E 84 (Class I/A).
2. Flammability: Noncombustible, when tested in accordance with ASTM E 136.
3. Flexural Strength: At least 1450 psi (10 MPa) when in equilibrium condition, and at least 1015 psi (7 MPa) when in wet condition, tested in accordance with ASTM C 1185.
4. Coefficient of Thermal Expansion: Less than 1 x 10^-5/inch/inch/degree F (0.5 x 10^-5/degree C), when tested in accordance with ASTM E 228.
5. Water Vapor Transmission: Less than 7.0 perm-inch (10 ng/(Pa s m), when tested in accordance with ASTM E 96.
6. Freeze Thaw Resistance: At least 80 percent flexural strength retained, when tested in accordance with ASTM C 1185.
7. UV Resistance: No cracking, checking, or erosion, when tested for 2000 hours in accordance with ASTM G 26.
8. Water Tightness: No water droplets on underside, when tested in accordance with ASTM C 1185.

Horizontal Siding: CertainTeed WeatherBoards, FiberCement Siding or equal.
1. Thickness: 5/16 inch (8 mm), nominal.
2. Length: 12 feet (3657 mm), nominal.
4. Width: 5-1/4 inches (133 mm) wide.
5. Finish: Factory sealed with FiberTect.

Vertical Siding: CertainTeed WeatherBoards, FiberCement Siding or equal.
1. Thickness: 5/16 inch (8 mm), nominal.
2. Size: 48 by 96 inches (1220 by 2440 mm), nominal.
3. Style: Cedar panel, no grooves.
2.3 ACCESSORIES
A. Trim: Fiber cement board, cut from siding material; cut edges primed.
B. Provide the following trim:
   1. Starter strip for lap siding.
   2. Outside corners, butted to siding.
   3 Fascia board.
C. Sealant: Paintable, 100 percent acrylic latex caulk complying with ASTM C 920.
D. Sheet Metal Flashing: Minimum 26 gauge hot-dipped galvanized steel sheet, or aluminum.
E. Nails: Length as required to penetrate minimum 1-1/4 inch (32mm) into solid backing; hot-dipped galvanized or stainless steel.
I. Building Paper: Kraft or bituminous paper; not polyethylene or foil.
J. Finish Paint: As specified in Section 09900.

PART 3 EXECUTION

3.1 EXAMINATION
A. Prior to commencing installation, verify governing dimensions of building and condition of substrate.

3.2 PREPARATION
A. Examine, clean, and repair
B. Do not begin installation until unacceptable conditions have been corrected.

3.3 INSTALLATION
A. Install in accordance with manufacturer’s instructions and drawing details.
   1. Read warranty and comply with all terms necessary to maintain warranty coverage.
   2. Install in accordance with conditions stated in model code evaluation report applicable to location of project.
   3. Use trim details indicated on drawings.
   4. Touch up all field cut edges before installing.
   5. Pre-drill nail holes if necessary to prevent breakage.
B. Over Wood Studs Without Sheathing: Install building paper over studs prior to installing siding.
C. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs
D. Over Foam Sheathing: Read and comply with sheathing manufacturer’s recommendations.
   1. For sheathing of 1 inch (25 mm) thickness or less, nail through sheathing into studs using correspondingly longer nails.
   2. For sheathing over 1 inch (25 mm) thickness, install furring strips over studs and fasten siding through furring and into studs.
E. Over Masonry Walls: Install furring strips of adequate thickness to accept full length of nails and spaced at 16 inches (406 mm) on center.
F. Allow space between both ends of siding panels that butt against trim for thermal movement; seal joint between panel and trim with exterior grade sealant.
I. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.
J. Joints in Vertical Siding: Install Z-flashing in horizontal joints between successive courses of vertical siding.

K. Install sheet metal flashing above door and window casings and horizontal trim in field of siding.

L. Do not install siding less than 6 inches (150 mm) from surface of ground nor closer than 1 inch (25 mm) to roofs, patios, porches, and other surfaces where water may collect.

M. After installation, seal all joints except lap joints of lap siding. Seal around all penetrations. Paint all exposed cut edges.

N. Finish Painting: Specified in Section 09900.

P. Finish Painting: Within 24 months after installation, paint siding and trim with one coat finish

3.4 CLEANING

   A. At completion of work, remove debris caused by siding installation from project site.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 07610 - SHEET METAL ROOFING

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. Standing-seam metal roofing.

B. Related Sections include the following:

1. Division 6 Section "Miscellaneous Carpentry" for wood decking.
2. Division 7 Section "Sheet Metal Flashing and Trim" for flashing not part of roofing and other sheet metal work.

1.3 PERFORMANCE REQUIREMENTS

A. Install sheet metal roofing capable of withstanding normal thermal movement, wind loading, structural movement, thermally induced movement, and exposure to weather without failure or infiltration of water into the building interior.

1.4 SUBMITTALS

A. Product Data: For each product indicated. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes.

B. Shop Drawings: Show details for forming, joining, and securing metal roofing, and for pattern of seams. Show expansion-joint details and waterproof connections to adjoining work and at obstructions and penetrations.

C. Samples for Verification: 12-inch- (300-mm-) square specimens of metal roofing material with specified finishes applied. Where finishes involve normal color and texture variations, include Sample sets of 2 or more units showing the full range of variations expected.

D. Product Certificates: Signed by manufacturers of the following products certifying that the products furnished comply with requirements:
1. Sheet metal roofing.
2. Special finishes.

E. Qualification Data: For firms and persons specified in the "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.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed sheet metal roofing similar in material, design, forming method, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Industry Standard: Unless otherwise shown or specified, comply with the Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown.

C. Wind-Uplift Resistance: Provide roof assemblies that meet requirements of UL 580 for Class 90 wind-uplift resistance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver metal coils, panels, and other roofing materials so they will not be damaged or deformed. Package roofing materials for protection against transportation damage.

B. Handling: Exercise care in unloading, storing, and erecting roofing materials to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight and ventilated covering. Store metal roof coils and panels to ensure dryness. Do not store coils or panels in contact with other materials that might cause staining, denting, or other surface damage.

1.7 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
B. Special Finish Warranty: Submit a written warranty executed by the manufacturer covering failure of the factory-applied exterior finish on metal roofing within the specified warranty period and agreeing to repair finish or replace sheet metal roofing that evidences finish deterioration. Deterioration of finish includes, but is not limited to, color fade, chalking, cracking, peeling, and loss of film integrity.

1. Warranty Period: 20 years from date of Substantial Completion.

C. Special Weathertight Warranty: Submit a written warranty executed by the manufacturer agreeing to repair or replace sheet metal roofing that fails to remain weathertight within the specified warranty period.

1. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Berridge Manufacturing Co.
2. Englert, Inc.
3. Modern Metal Systems, Inc.
4. Petersen Aluminum Corp.

2.2 ROOFING SHEET METALS

A. Standing Seam Metal Panels:

1. Metal Sheet: Match existing building.
2. Thickness: Match existing building.

2.3 UNDERLAYMENT MATERIALS

A. Building Paper: Minimum 5 lb/100 sq. ft. (2.4 kg/sq. m), rosin sized.

B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts.
2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and accessory items as required for a complete roofing system and as recommended by sheet metal manufacturer and fabricator for metal roofing work, unless otherwise indicated.

B. Expansion-Joint Sealant: For hooked-type expansion joints, which must be free to move, provide nonsetting, nonhardening, nonmigrating, heavy-bodied polyisobutylene sealant.

C. Metal Accessories: Provide components matching sheet metal roofing in finish and material that are required for a complete roofing system, including the following:
   2. Trim, copings, fasciae, and louvers.

D. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

E. Elastomeric Joint Sealant: ASTM C 920, of base polymer, type, grade, class, and use classifications required to produce joints in roofing that will remain weathertight and as recommended by the roofing manufacturer for installation indicated.

F. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat, unless otherwise indicated. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.5 FABRICATION

A. General: Fabricate sheet metal roofing to match existing metal panel roof. Comply with metal roofing manufacturer's written instructions and with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of installation indicated.

B. Fabricate sheet metal to allow for expansion in running work sufficient to prevent leakage, damage, and deterioration of the Work. Form exposed sheet metal work to fit substrates without excessive oil canning, buckling, and tool marks, true to line and levels indicated, and with exposed edges folded back to form hems.

C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, or would not be sufficiently waterproof and weatherproof, form
expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant (concealed within joints).

D. Sealant Joints: Where movable, nonexpansion-type joints are indicated or required to produce weathertight seams, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

E. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with bituminous coating or other permanent separation as recommended by manufacturer or fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements indicated for conditions affecting performance of sheet metal roofing. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate metal roofing with rain drainage work, flashing, trim, and construction of decks, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

B. Promptly remove protective film, if any, from exposed surfaces of metal roofing. Strip with care to avoid damage to finish.

3.3 INSTALLATION, GENERAL

A. Install roofing to comply with sheet metal roofing manufacturer's written instructions, unless otherwise indicated.

B. Separate dissimilar metals by painting each metal surface in area of contact with a bituminous coating, by applying rubberized-asphalt underlayment to each metal surface, or by other permanent separation as recommended by manufacturers of dissimilar metals.

C. Install felt underlayment and building's paper slip sheet on substrate under metal roofing, unless otherwise recommended by sheet metal manufacturer. Use adhesive for temporary anchorage, where possible, to minimize use of mechanical fasteners under
metal roofing. Apply from eave to ridge in shingle fashion and lap joints 2 inches (50 mm) minimum.

D. Install building paper as only underlayment under terne metal.

E. Coat back side of metal roofing with bituminous coating where it will contact wood, ferrous metal, or cementitious construction.

F. Form and fabricate sheets, seams, strips, cleats, valleys, ridges, edge treatments, integral flashings, and other components of metal roofing to profiles, patterns, and drainage arrangements shown and as required for leakproof construction. Provide for thermal expansion and contraction of the Work. Seal joints as shown and as required for leakproof construction. Shop fabricate materials to greatest extent possible.

G. Sealant-Type Joints: Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature is moderate, between 40 and 70 deg F (4 and 21 deg C), at time of installation, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C). Comply with requirements of Division 7 Section "Joint Sealants" for handling and installing sealants.

H. Fabricate and install work with lines and corners of exposed units true and accurate. Form exposed faces flat and free of buckles, excessive waves, and avoidable tool marks, considering temper and reflectivity of metal. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant. Fold back sheet metal to form a hem on concealed side of exposed edges, unless otherwise indicated.

I. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

3.4 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

3.5 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure metal roofing is without damage or deterioration at the time of Substantial Completion.
SECTION 07620 - FLASHING AND SHEET METAL

1.0 PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this section.

1.2 SUMMARY

This Section includes the following:
- Elastic flashing.
- Gutters and downspouts (rain drainage).

1.3 SUBMITTALS

Product data: Flashing, Sheet Metal, and Accessories: Manufacturer's technical product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

Shop drawings showing layout, profiles, methods of joining, and anchorages details, including major counter-flashings, trim/fascia units, scuppers, and copings.

1.4 PROJECT CONDITIONS

Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

2.0 PART 2 - PRODUCTS

2.1 SHEET METAL FLASHING AND TRIM MATERIALS

Pre-Finished Steel: Commercial quality with 0.20 percent copper, ASTM A 526 except ASTM A 527 for lock-forming, 24 gauge except as otherwise indicated.

Fluorocarbon Coating: Inhibitive thermo-cured primer, 0.2 min. mil dry film thickness, and thermo-cured fluorocarbon coating containing "Kynar 500" resin, 1.0 mil min. dry film thickness.

Organic Coating: Manufacturer's standard thermostadt acrylic enamel, 0.8 mil min. dry film thickness.

2.2 FLEXIBLE SHEET MEMBRANE FLASHING

Elastic Sheet Flashing/Membrane: Nonreinforced flexible, black elastic sheet flashing of 50 to 65 mils thickness and complying with the following:

Shore A Hardness (ASTM D 2240): 50 to 70.
Tensil Strength (ASTM D 412): 1200 psi.
Tear Resistance (ASTM D 624, Die C): 20 lbs. per linear inch.
Ultimate elongation (ASTM D 412): 250 percent.
Low temperature brittleness (ASTM D 746): minus 30 degrees F (minus 35 degrees C).
Resistance to ozone aging (ASTM D 1149): no cracks for 10 percent elongated sample for 100 hours in 50 pphm (50.5 mPa) ozone at 104 degrees F (70 degrees C).
Resistance to Heat Aging (ASTM D 573): maximum hardness increase of 15 points, elongation reduction of 40 percent, and tensile strength reduction of 30 percent, for 70 hours at 212 degrees F (100 degrees C).

Acceptable Products:

EPDM synthetic rubber sheet.

2.3 MISCELLANEOUS MATERIALS AND ACCESSORIES:

Fasteners: Same metal as flashing/sheet metal or, other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

Mastic Sealant: Polysisobutylene; nonhardening, nonskinning, non-drying, nonmigrating sealant.

Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealers."

Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.

Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet.


Polyethylene Underlayment: Minimum 6-mil carbonated polyethylene film; resistant to decay when tested in accordance with ASTM E 154.

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 gage required for performance.

2.4 FABRICATED UNITS

General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.
 Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

3.0 PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

Install elastic flashing in accordance with manufacturer's recommendations. Where required, provide for movement at joints by forming loops or bellows in width of flashing. Locate cover or filler strips at joints to facilitate complete drainage of water from flashing. Seam adjacent flashing sheets with adhesive, seal and anchor edges in accordance with manufacturer's recommendations.

3.2 CLEANING AND PROTECTION

Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

Protection: Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering at time of substantial completion.

END OF SECTION 0762
SECTION 07720 - ROOF ACCESSORIES

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. Roof hatches.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 6 Section "Rough Carpentry" for roof deck and nailers.
   2. Division 7 Section for roofing types and roofing accessories included as part of roofing Work.
   3. Division 7 Section "Flashing and Sheet Metal" for metal flashing, valleys, gutters, and downspouts.

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

B. Product data for each type of product specified. Submit manufacturer's detailed technical product data, installation instructions and recommendations, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.

C. Shop drawings showing fabrication and installation of each roof accessory specified including fully dimensioned plans, elevations, sections, details of components, and attachments to other units of Work. Also show layout, anchorage details, rough-in requirements, and conditions on the roof or for other accessories.

1.4 QUALITY ASSURANCE
A. Standards: Comply with the following:

1. SMACNA "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap-flashing to coordinate with type of roofing indicated.
2. NRCA "Roofing and Waterproofing Manual" details for installation of units.

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. Roof Hatches:
   a. Babcock-Davis Hatchways, Inc.
   b. Bilco Co.
   c. Bristolite Skylights.
   d. Dur-Red Products.
   e. Hillsdale Industries.
   f. Milcor, Inc.
   g. Naturalite/EPI Skylight Systems.
   h. O'Keeffe's, Inc.
   i. Plasteco, Inc.
   j. Plasticrafts, Inc.
   k. ThyCurb Div./ThyBar Corp.
   l. Wasco Products, Inc.

2.2 MATERIALS, GENERAL

A. Commercial-Quality Galvanized Steel Sheet: ASTM A 526 (ASTM A 526M) with G90 (Z275) coating complying with ASTM A 525 (ASTM A 525M).

B. Galvalume-Coated Steel Sheet: ASTM A 792 (ASTM A 792M) with class AZ-50 (AZ-150) coating, Grade 40 (Grade 275), or to suit manufacturer's standards.

C. Insulation: Manufacturer's standard rigid or semirigid glass-fiber board of thickness indicated.

D. Wood Nailers: Softwood lumber, pressure treated with water-borne preservatives for above-ground use, complying with AWPA C2; not less than 1-1/2 inch (38 mm) thick.
E. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
   1. Where removal of exterior exposed fasteners affords access to building, provide nonremovable fastener heads.

F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene or polyvinyl chloride, or block design of sponge neoprene.

G. Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4 mm) dry film thickness per coating.

H. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

I. Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25, and Uses NT, G, and A.

2.3 ROOF HATCHES

A. General: Fabricate units to withstand 40-lbf/sq. ft. (1.9 kPa) external loading and 20-lbf/sq. ft. (0.95 kPa) internal loading pressure. Frame with 9-inch (225 mm) high, integral-curb, double-wall construction with 1-1/2 inch (38 mm) insulation, cant strips and cap flashing (roofing counterflashing), with welded or sealed mechanical corner joints. Provide double-wall cover (lid) construction with 1 inch insulation core. Provide gasketing and equip corrosion-resistant or hot-dip galvanized hardware including pintle hinges, hold-open devices, interior padlock hasps, and both interior and exterior latch handles.

B. Type: Single-leaf personnel access.
   1. For Ladder Access: 30 x 36 inches.

C. Material: Zinc-coated steel sheets.

D. Sloping Roofs: Where slope or roof deck exceeds 1/4 inch per foot (1:48), fabricate hatch curbs with height tapered to match slope to level tops of units.

PART 3 - EXECUTION
3.1 INSTALLATION

A. General: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, vapor barriers, roof insulation, roofing and flashing, as required, to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses, as well as inward and outward loading pressures.

1. Except as otherwise indicated, install roof accessory items according to construction details of NRCA "Roofing and Waterproofing Manual."

B. Isolation: Where metal surfaces of units are to be installed in contact with incompatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.

C. Flange Seals: Unless otherwise indicated, set flanges of accessory units in a thick bed of roofing cement to form a seal.

D. Cap Flashing: Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing (as counterflashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.

E. Operational Units: Test operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.2 CLEANING AND PROTECTION

A. Clean exposed metal and plastic surfaces according to manufacturer's instructions. Touch up damaged metal coatings.

END OF SECTION 07720
SECTION 07901 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes joint sealants for the following locations:

1. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:
   a. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
   b. Perimeter joints of toilet fixtures.
   c. Other joints as indicated.

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

1. Division 8 "Glass and Glazing" for sealants used in glazing.
2. Division 9 Section "Gypsum Drywall" for sealing concealed perimeter joints of gypsum board partitions to reduce sound transmission.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data from manufacturers for each joint sealant product required.
C. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have
resulted in construction with a record of successful in-service performance.

B. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

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 period for use, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
2. When joint substrates are wet.

B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors: Provide color of exposed joint sealants to comply with the following:

1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

2.2 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing
elastomeric sealants that comply with ASTM C 920 and other requirements indicated on each Elastomeric Joint Sealant Data Sheet at end of this Section, including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.

2.3 SOLVENT-RELEASE-CURING JOINT SEALANTS

A. Acrylic Sealant: Manufacturer's standard one-part, nonsag, solvent-release-curing acrylic terpolymer sealant complying with AAMA 808.3 or FS TT-S-00230 or both, with capability when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the following percentage change in joint width existing at time of application and remain adhered to joint substrates indicated for Project without failing cohesively:

1. 12-1/2 percent movement in both extension and compression for a total of 25 percent.

B. Butyl Sealant: Manufacturer's standard one-part, nonsag, solvent-release-curing, polymerized butyl sealant complying with ASTM C 1085 and formulated with minimum of 75 percent solids to be nonstaining, paintable, and have a tack-free time of 24 hours or less.

C. Pigmented Narrow Joint Sealant: Manufacturer's standard, solvent-release-curing, pigmented synthetic rubber sealant complying with AAMA 803.3 and formulated for sealing joints 3/16 inch (5 mm) or smaller in width.

D. Available Products: Subject to compliance with requirements, solvent-release-curing joint sealants that may be incorporated in the Work include, but are not limited to, the following:

1. Acrylic Sealant:
   a. "PTI 738," Protective Treatments, Inc.
   b. "PTI 767," Protective Treatments, Inc.

2. Butyl Sealant:
   b. "PTI 757," Protective Treatments, Inc.

3. Pigmented Narrow Joint Sealant:

2.4 LATEX JOINT SEALANTS
A. General: Provide manufacturer's standard one-part, nonsag, mildew-resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.

B. Acrylic-Emulsion Sealant: Provide product complying with ASTM C 834 that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.

C. Silicone Emulsion Sealant: Provide product complying with ASTM C 834 and, except for weight loss measured per ASTM C 792, with ASTM C 920 that accommodates joint movement of not more than 25 percent in both extension and compression for a total of 50 percent.

D. Available Products: Subject to compliance with requirements, latex joint sealants that may be incorporated in the Work include, but are not limited to, the following:
   1. Acrylic-Emulsion Sealant:
      c. "Tremco Acrylic Latex 834," Tremco, Inc.
   2. Silicone-Emulsion Sealant:

2.5 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:
   1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90.
   2. Product has flame spread and smoke developed ratings of less than 25 per ASTM E 84.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

C. Available Products: Subject to compliance with requirements, acoustical joint sealants that may be incorporated in the Work include, but are not limited to, the following:
1. Acoustical Sealant:

2. Acoustical Sealant for Concealed Joints:

2.6 JOINT SEALANT BACKING

A. General: Provide sealant backings of material and type 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. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
   1. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.

C. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer 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 concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
   3. Remove laitance and form release agents from concrete.
   4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS
A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
   1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
      a. Do not leave gaps between ends of joint fillers.
      b. Do not stretch, twist, puncture, or tear joint fillers.
      c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
   2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

E. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

F. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
   1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved 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 or from damage resulting from construction operations or other causes so that they 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 that and installations with repaired areas are indistinguishable from original work.

END OF SECTION 07901
SECTION 08211 - FLUSH WOOD DOORS

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. Solid-core doors with wood-veneer faces.
   2. Factory finishing flush wood doors.

B. Related Sections include the following:
   1. Division 8 Section "Flush Metal Doors and Frames" for metal door frames.

1.3 SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction, trim for openings, and louvers.
   1. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
   1. Indicate dimensions and locations of mortises and holes for hardware.
   2. Indicate dimensions and locations of cutouts.
   3. Indicate requirements for veneer matching.
   4. Indicate doors to be factory finished and finish requirements.
   5. Indicate fire ratings for fire doors.

C. Samples for Initial Selection: Color charts consisting of actual materials in small sections for the following:
1. Faces of factory-finished doors with transparent finish. Show the full range of colors available for stained finishes.

D. Samples for Verification: As follows:

1. Corner sections of doors approximately 8 by 10 inches (200 by 250 mm) with door faces and edgings representing the typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.
2. Frames for light openings, 6 inches (150 mm) long, for each material, type, and finish required.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.

B. Quality Standard: Comply with the following standard:


1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's written instructions.

1. Individually package doors in cardboard cartons and wrap bundles of doors in plastic sheeting.

B. Mark each door with individual opening numbers used on Shop Drawings. Use removable tags or concealed markings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
1.7 WARRANTY

A. General Warranty: Door manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form, signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch (6.35 mm) in a 42-by-84-inch (1067-by-2134-mm) section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span, or do not comply with tolerances in referenced quality standard.

1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
2. Warranty shall be in effect during the following period of time after the date of Substantial Completion:


PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Flush Wood Doors:

   a. Algoma Hardwoods Inc.
   b. Ampco Products, Inc.
   c. Buell Door Co.
   d. Chappell Door Co.
   e. Eagle Plywood & Door Manufacturing, Inc.
   f. Eggers Industries; Architectural Door Division.
   g. Graham Manufacturing Corp.
   h. Haley Brothers, Inc.
   i. Ideal Wood Products, Inc.
   j. IPIK Door Co., Inc.
   k. Marlite.
   l. Mohawk Flush Doors, Inc.
m. Oshkosh Architectural Door Co.
n. Poncraft Door Co.
o. Vancouver Door Company, Inc.
p. V-T Industries Inc.
q. Weyerhaeuser Co.

2.2 DOOR CONSTRUCTION, GENERAL

A. Doors for Transparent Finish: Comply with the following requirements:
   1. Grade: Premium, with Grade AA faces.
   2. Faces: Oak, plain sliced.
   4. Pair and Set Match: Provide for pairs of doors and for doors hung in adjacent sets.
   5. Stiles: Same species as face or a compatible species.

2.3 SOLID-CORE DOORS

A. Particleboard Cores: Comply with the following requirements:
   1. Particleboard: ANSI A208.1, Grade LD-1.
   2. Blocking: Provide wood blocking at particleboard-core doors as follows:
      a. 5-inch (125-mm) top-rail blocking, at doors indicated to have closers.
      b. 5-inch (125-mm) bottom-rail blocking, at exterior doors and doors indicated to have kick, mop, or armor plates.
      c. 5-inch (125-mm) midrail blocking, at doors indicated to have exit devices.

B. Interior Veneer-Faced Doors: Comply with the following requirements:
   1. Core: Particleboard core.
   2. Construction: Five or seven plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.

C. Fire-Rated Doors: Comply with the following requirements:
   1. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as required to provide fire rating indicated.
2. Blocking: For mineral-core doors, provide composite blocking with improved screw-holding capability approved for use in doors of fire ratings indicated and as follows:

a. 5-inch (125-mm) top-rail blocking.
b. 5-inch (125-mm) bottom-rail blocking, at doors indicated to have kick, mop, or armor plates.
c. 4-1/2-by-10-inch (114-by-250-mm) lock blocks.
d. 5-inch (125-mm) midrail blocking, at doors indicated to have exit devices.
e. As necessary to eliminate need for through-bolting hardware.

3. Edge Construction: At hinge stiles, provide manufacturer's standard laminated-edge construction with improved screw-holding capability and split resistance and with outer stile matching face veneer.

2.4 FABRICATION

A. Fabricate flush wood doors in sizes indicated for Project site fitting.

B. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.

1. Light Openings: Trim openings with moldings of material and profile indicated.

2.5 FACTORY FINISHING

A. General: Comply with referenced quality standard's requirements for factory finishing.

B. Finish wood doors at factory that are indicated to receive transparent finish. Field finish wood doors indicated to receive opaque finish.

C. Transparent Finish: Comply with requirements indicated for grade, finish system, staining effect, and sheen.

1. Grade: Premium.
2. Finish: Manufacturer's standard finish with performance requirements comparable to AWI System TR-4 conversion varnish.
3. Staining: As selected by Architect from manufacturer's full range of colors.

PART 3 - EXECUTION
3.1 EXAMINATION

A. Examine installed door frames before hanging doors.
   1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
   2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Division 8 Section "Door Hardware."

B. Manufacturer's Written Instructions: Install wood doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
   1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.

C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
   1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.
      a. Comply with NFPA 80 for fire-rated doors.
   2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
   3. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) on lock edge; trim stiles and rails only to extent permitted by labeling agency.

D. Factory-Finished Doors: Restore finish before installation, if fitting or machining is required at Project site.

3.3 ADJUSTING AND PROTECTING
A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Refinish or replace doors damaged during installation.

C. Protect doors as recommended by door manufacturer to ensure that wood doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08211
SECTION 08515 - WOOD WINDOWS

1.1 GENERAL

A. This Section includes wood windows of the types and performance grades indicated.

1. Provide windows engineered, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading without failure, as demonstrated by testing manufacturer's standard window assemblies representing types, grades, and sizes required for Project according to test methods indicated.

B. Performance-grade number is the actual design pressure in pounds force per square foot used to determine the structural test pressure and water test pressure.

C. Standards: Performance requirements for operating force, air infiltration, water penetration, structural performance, and forced-entry resistance for wood windows are specified in NWWDA I.S. 2, "Industry Standard for Wood Window Units."

1. Testing shall demonstrate compliance with NWWDA I.S. 2 for operating force, air infiltration, water penetration, structural performance, and forced-entry resistance for the type and performance grade of windows required.

2. Test Criteria: Testing shall be performed by a qualified independent testing agency based on the following criteria:

   a. Design wind velocity at Project site is 70 mi./h.
   b. Heights of window units above grade at the window centerline are indicated or can be determined from the Drawings. Consult with the Architect, if necessary, to confirm required loading and test pressures.

3. Test Procedures: Test window units according to ASTM E 283 for air infiltration, ASTM E 547 for water penetration, and ASTM E 330 for structural performance.

D. Submittals: Submit the following:

1. Product Data for each type of wood window required, including construction details and fabrication methods; profiles and dimensions of individual components; data on hardware, accessories, and finishes; and recommendations for maintenance and cleaning of exterior surfaces.

2. Shop Drawings of each type of window required, including layout and installation details; elevations at 1/4 inch = 1 foot scale and typical window unit elevations at 3/4 inch = 1 foot scale; and full-size section details of typical composite members, including reinforcement and stiffeners.
3. Samples for initial color selection on 12-inch-long sections of window members. Where finishes involve normal color variations, include Sample sets showing the full range of variations expected.

4. Test reports from a qualified independent testing agency indicating that each type, grade, and size of window unit complies with performance requirements indicated based on comprehensive testing of current window units within the last 5 years. Test results based on use of downsized test units will not be accepted.


   1. Provide safety glass permanently marked with the certification label of the Safety Glazing Certification Council (SGCC) or another certification agency acceptable to authorities having jurisdiction.


G. Insulating-Glass Certification Program: Provide insulating-glass units permanently marked on spacers or on one component pane of units with the appropriate certification label of the inspecting agency indicated below:

   1. Insulating Glass Certification Council (IGCC).

H. Product Options: Drawings indicate sizes, profiles, dimensional requirements, and aesthetic effects of wood windows and are based on the window types and models indicated. Other window manufacturers whose products have equal performance may be considered provided deviations in size, profile, and dimensions are minor and do not alter the aesthetic effect. Refer to Division 1 Section "Substitutions."

1.2 PRODUCTS

A. Manufacturer: Subject to compliance with requirements, provide window units by one of the following:

   1. Vetter
   2. Pella
   3. Marvin

B. Materials: Comply with NWWDA I.S. 2.

C. Wood: Clear ponderosa pine or other suitable fine-grain lumber, kiln dried to a moisture content of 6 to 12 percent at time of fabrication and free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch wide by
2 inches long. Lumber shall be water-repellent preservative treated after machining per NWWDA I.S. 4.

D. Aluminum Cladding: Formed sheet or extruded cladding in factory-applied, baked-on enamel finish, in color as selected from manufacturer's standard color range. Mechanically bond cladding to exterior wood sash and frame members.

1. Trim Members: Aluminum-clad wood, hollow-aluminum extrusions, or roll-formed aluminum.

E. Anchors, Clips, and Accessories: Fabricate of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel or iron complying with ASTM B 633 for SC 3 (severe) service condition; provide sufficient strength to withstand design pressure indicated.

F. Fasteners: Comply with NWWDA I.S. 2 for fabrication and with manufacturer's recommendations and standard industry practices for type and size of installation fasteners.

G. Compression-type weatherstripping designed for permanently resilient sealing under bumper or wiper action, and completely concealed when sash is closed.


H. Glass-Fiber-Mesh Insect Screen: 18-by-14 or 18-by-16 mesh of plastic-coated glass-fiber threads, woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656.

I. Glass and Glazing Materials: Low E, sealed, insulating glazing material that complies with Division 8 Section "Glazing."

J. Glazing Seal: Extruded, vinyl, or butyl glazing gasket providing weathertight seal.

K. Hardware: Manufacturer's standard hardware, necessary to operate, tightly close, and securely lock windows. Do not use aluminum in frictional contact with other metals.

1. Solid metal hardware with a special coating finish and plated steel or brass/bronze operating bars and rods.

L. Gear-Type Rotary Operators: Comply with AAMA 901.1 for rotary operators. Comply with ASTM E 405, Method A, when subjected to operating moments and closing torques indicated in AAMA 101. Operator shall operate all ventilators simultaneously, securely closing them at both jambs without using additional manually controlled locking devices.

M. Limit Device: Concealed support arms with an adjustable, limited, hold-open limit device designed to restrict ventilator opening.
N. Grilles (False Muntins): Provide grilles in designs shown, for removable application to inside of each sash light.

2. Design: Manufacturers standard profile.

O. Double Hung Windows: Comply with NWWDA Performance Grade DP15.

1. Hardware: Provide the manufacture standard.

P. Fixed Windows: Comply with NWWDA Performance Grade DP15.

Q. Fabrication: Fabricate window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.

1. Comply with NWWDA I.S. 2 for moisture content of lumber at time of fabrication.

R. Wood Finish: Provide the following finish on exposed wood in units:

1. Shop-Primed Units: Manufacturer's standard shop-prime coat on exterior wood surfaces only.

1.3 EXECUTION

A. Examine openings before installation. Verify that opening is correct and sill plate is level.

1. Masonry surfaces shall be dry and free of construction debris.
2. Wood frame walls shall be dry, clean, sound, well-nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches of corner.

B. Installation: Comply with manufacturer's recommendations for installing window units, hardware, operators, accessories, and other components. Coordinate window installation with wall flashings and other built-in components. Set windows plumb, level, true to line, without warp or rack of frames or sash. Anchor securely in place.

C. Set sill members in a bed of sealant or with joint fillers or gaskets to provide weathertight construction.
D. Adjust operating sash and hardware to provide a tight fit at contact points and weatherstripping for smooth operation and a weathertight closure. Lubricate hardware and moving parts.

E. Clean surfaces immediately after installation. Avoid damage to coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances.

F. Clean glass immediately after installing windows. Remove nonpermanent labels from glass surfaces. Replace glass that has been broken, chipped, cracked, abraded, or damaged during construction.

G. Protect window units from damage until the time of Substantial Completion.

END OF SECTION 08515
SECTION 08710 - FINISH HARDWARE

1.0 PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

Extent of finish hardware required is indicated on drawings and in schedules.

Types of finish hardware required include the following:

- Hinges
- Lock cylinders and keys
- Lock and latch sets
- Closers
- Weatherstripping for exterior doors
- Thresholds

Silencers included integral with hollow metal frames are specified with door frames elsewhere in Division 8.

1.3 QUALITY ASSURANCE:

Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor.

1.4 SUBMITTALS:
Product Data: Submit manufacturers technical product data for each item of hardware in accordance with Division-1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

Hardware Schedule: Submit final hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.

Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

- Type, style, function, size and finish of each hardware item.
- Name and manufacturer of each item.
- Fastenings and other pertinent information.
- Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
- Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
- Mounting locations for hardware.
- Door and frame sizes and materials.
- Keying information.

Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

1.5 PRODUCT HANDLING:

Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that
completion of the work will not be delayed by hardware losses, both before and after installation.

2.0 PART 2 - PRODUCTS

2.1 SCHEDULED HARDWARE:

Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following.

Manufacturer's Product Designations: One or more manufacturers are listed for each hardware type required. An asterisk (*) after a manufacturer's name indicates whose product designation is used in the Hardware Schedule for purposes of establishing minimum requirements. Provide either the product designated, or, where more than one manufacturer is listed, the comparable product of one of the other manufacturers which comply with requirements including those specified elsewhere in this section.

2.2 MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work, but are not limited to the following:

Hinges: Hager (*); Soss; Stanley.

Locks: Yale (*); Corbin; Schlage; Sargent.

Cylinders: Best

Flush Bolts: Trimco (*); Baldwin; Cipco; Ives.

Closers: Norton (*); LCN; Sargent.

Threshold: National Guard (*); Reese; Van Duprin; Zero.

Weatherstripping: National Guard (*); Stanley; Zero.

2.3 MATERIALS AND FABRICATION:

General:
Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.

Manufacturer's identification will be permitted on rim of lock cylinders only.

Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.

Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.

Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.4 HINGES, BUTTS AND PIVOTS:

Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

Hinges: Shall be five-knuckle construction. Hinges for exterior doors shall be solid bronze.
with non-removable pins, in the finish specified. Hinges for interior doors shall be steel, plated in the finish specified. Oil impregnated bearings are not an acceptable substitute for ball bearings. All hinges shall be 4-1/2" x 4-1/2" x .134" unless otherwise specified.

Number of hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.

2.5 LOCK CYLINDERS AND KEYING:

General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), either new or integrated with Owner's existing system.

Equip locks with manufacturer's standard Best 6-pin tumbler cylinders.

Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.

Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system.

2.6 LOCKS, LATCHES AND BOLTS:

Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.

Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.

Lock Throw: Provide 5/8" minimum throw of latch and deadbolt used on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

Provide 1/2" minimum throw on other latch and deadlock bolts.

Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod for doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.

2.7 CLOSERS AND DOOR CONTROL DEVICES:
Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use. All units shall be handicapped accessible, complying with ANSI A117.1 provisions for door opening force and delayed action closing.

Provide parallel arms for all overhead closers, except as otherwise indicated.

Provide grey resilient parts for exposed bumpers.

2.8 WEATHERSTRIPPING:

General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.

Weatherstripping at Jambs and Heads:

Provide bumper-type resilient insert surface-applied unless shown as mortised or semi-mortised, finish and resilient bumper material:

Flexible, hollow neoprene bulb or loop insert, conforming to MIL R 6055, Class II, Grade 40.

Weatherstripping at Door Bottoms:

Provide threshold consisting of contact type resilient insert and metal housing of design and size shown; of following metal, finish, and resilient seal strip:

   Extruded aluminum with natural anodized finish; 0.062" minimum thickness of main walls and flanges.

   Extruded aluminum with color anodized finish as selected by Architect from manufacturer's standard color range; 0.062" minimum thickness of main walls and flanges.

2.9 THRESHOLDS:

General: Except as otherwise indicated provide standard metal threshold unit of type, size and profile as shown or scheduled.

Exterior Hinged/Pivoted Doors: Provide units not less than 4" wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames.
2.10 HARDWARE FINISHES:

Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.

The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI A156.18 "Materials & Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

3.0 PART 3 - EXECUTION

3.1 INSTALLATION:

Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.

Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3.2 ADJUST AND CLEAN:

Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

Clean adjacent surfaces soiled by hardware installation.

Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware
finishes, during the final adjustment of hardware.

3.3 **FINISH HARDWARE:**

**Hardware Set #1:**
Hardware to be supplied and installed for exterior metal insulated door and to include the following:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ea.</td>
<td>Cylinder</td>
</tr>
<tr>
<td>1 ea.</td>
<td>Closer</td>
</tr>
<tr>
<td>3 ea.</td>
<td>Hinge</td>
</tr>
<tr>
<td>1 ea.</td>
<td>Lockset</td>
</tr>
<tr>
<td>1 ea.</td>
<td>Threshold</td>
</tr>
<tr>
<td>1 roll</td>
<td>Weatherstripping</td>
</tr>
</tbody>
</table>

**Hardware Set #2:**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 ea.</td>
<td>Hinge</td>
<td>BB1199 NRP</td>
</tr>
<tr>
<td>1 ea.</td>
<td>Lever Lockset</td>
<td>With Best core</td>
</tr>
</tbody>
</table>

**Hardware Set #3:**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 ea.</td>
<td>Hinge</td>
<td>BB1199 NRP</td>
</tr>
<tr>
<td>1 ea.</td>
<td>Lockset</td>
<td>Lever Passage</td>
</tr>
</tbody>
</table>

END OF SECTION 08710
SECTION 08800 - GLASS AND GLAZING

1.0  PART 1 - GENERAL

1.1  RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary
Conditions and Division-1 Specification sections, apply to work of this section.

1.2  SUMMARY:

Extent of glass and glazing work is indicated on drawings and schedules.

Types of work in this section include glass and glazing for:

  Storefront construction.

  Entrances and other doors, not indicated as "preglazed".

1.3  SYSTEM DESCRIPTION:

Provide glass and glazing that has been produced, fabricated and installed to withstand
normal thermal movement, wind loading and impact loading (where applicable), without
failure including loss or breakage of glass, failure of sealants or gaskets to remain
watertight and airtight, deterioration of glass and glazing materials and other defects in the
work.

Normal thermal movement is defined as that resulting from an ambient temperature
range of 120 deg. F (67 deg. C) and from a consequent temperature range within glass
and glass framing members of 180 deg. F (100 deg. C).

Deterioration of coated glass is defined as the development of manufacturing defects
including peeling, cracking or other indications of deterioration in metallic coating due
to normal conditions of use.

1.4  SUBMITTALS:

Product Data:  Submit manufacturer's technical data for each glazing material and
fabricated glass product required, including installation and maintenance instructions.

Samples:  Submit, for verification purposes, 12" square samples of each type of glass
indicated except for clear single pane units, and 12" long samples of each color required
(except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative of adjoining framing system in color.

Certificate: Submit certificates from respective manufacturers attesting that glass and glazing materials furnished for project comply with requirements.

Separate certification will not be required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE:

Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.

Safety Glazing Standard: Where safety glass is indicated or required by authorities having jurisdiction, provide type of products indicated which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.

Single Source Responsibility for Glass: To ensure consistent quality of appearance and performance, provide materials produced by a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.

1.6 DELIVERY, STORAGE, AND HANDLING:

Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

1.7 PROJECT CONDITIONS:

Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

1.8 WARRANTY:
General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

Manufacturer's Special Project Warranty on Coated Glass Products: Provide written warranty signed by manufacturer of coated glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those coated glass units which develop manufacturing defects. Manufacturing defects are defined as peeling, cracking or deterioration in metallic coating due to normal conditions and not due to handling or installation or cleaning practices contrary to glass manufacturer's published instructions.

Warranty Period: Manufacturer's standard but not less than 5 years after date of substantial completion.

Manufacturer's Special Project Warranty on Insulating Glass: Provide written warranty signed by manufacturer of insulating glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects. Manufacturing defects are defined as failure or hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coatings, if any, and other visual indications of seal failure or performance; provided the manufacturer's instructions for handling, installing, protecting and maintaining units have been complied with during the warranty period.

Warranty Period: Manufacturer's standard but not less than 10 years after date of substantial completion.

2.0 PART 2 - PRODUCTS

2.1 MANUFACTURERS:

Manufacturers: Subject to compliance with requirements, provide products of one of the following:

Manufacturers of Heat-Treated Spandrel Glass:

Virginia Glass Products Corporation

Manufacturers of Insulating Glass:

AFG Industries, Inc.

2.2 GLASS PRODUCTS, GENERAL:
Primary Glass Standard: Provide primary glass which complies with ASTM C 1036 requirements, including those indicated by reference to type, class, quality, and, if applicable, form, finish, mesh and pattern.

Heat-Treated Glass Standard: Provide heat-treated glass which complies with ASTM C 1048 requirements, including those indicated by reference to kind, condition, type, quality, class, and, if applicable, form, finish, and pattern.

Sizes: Fabricate glass to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Provide thicknesses indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.

2.3 PRIMARY GLASS PRODUCTS:

Tinted Float Glass: Type I (transparent glass, flat), Class 2 (tinted heat absorbing and light reducing), Quality q3 (glazing select), and as follows:

2.4 HEAT-TREATED GLASS PRODUCTS:

Manufacturing Process: Manufacture heat-treated glass as follows:

By horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed, unless otherwise indicated.

Kind HS (heat strengthened).

Color: Azurlite

2.5 ELASTOMERIC GLAZING SEALANTS AND PREFORMED GLAZING TAPES:

General: Provide products of type indicated and complying with the following requirements:

Compatibility: Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.

Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.

Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

2.6 MISCELLANEOUS GLAZING MATERIALS:

Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.

Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.

Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.

Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

3.0 PART 3 - EXECUTION

3.1 EXAMINATION:

Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Obtain Glazier's written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION:
Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

3.3 GLAZING, GENERAL:

Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

Glazing channel dimensions as indicated in details are intended to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.

Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.

Apply primers to joint surfaces where required for adhesion of sealants, as determined by proconstruction sealant-substrate testing.

3.4 GLAZING:

Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6" from corner, unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.

Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.

Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.

Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

Tool exposed surfaces of sealants to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.

Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.6 PROTECTION AND CLEANING:

Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.

Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Wash glass by method recommended by glass manufacturer.
END OF SECTION 08800
SECTION 08830 - MIRRORED GLASS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Product certificates signed by manufacturers of mirrored glass certifying that their products and edge sealers comply with specified requirements.

1.2 QUALITY ASSURANCE

A. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" except where more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined in this Section or referenced standards.

B. Mirror Manufacturers' Document: Comply with recommendations of National Association of Mirror Manufacturers (NAMM) in its publication "MIRRORS, Handle with Extreme Care, Tips for the Professional on the Care and Handling of Mirrors."

C. Preconstruction Mirror Mastic Glass Coating Compatibility Test: Submit mirror mastic products to manufacturer of protective organic coating for testing by coating manufacturer's standard test method to determine compatibility of adhesive with mirrored glass coating.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's instructions for shipping, storing, and handling mirrored glass; avoid deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors, protected from moisture including condensation.

1.4 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with mirrored glass installation until ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

PART 2 - PRODUCTS

MIRRORED GLASS
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. American Mirror Co.
2. Bassett Mirror Co.
3. Binswanger Mirror Products
4. Carolina Mirror Corp.
5. Consolidated Glass & Mirror Corp.
6. Donisi Mirror Co., Inc.
7. Falconer Glass Industries, Inc.
8. Gardner Mirror Corp.
9. Gilded Mirrors, Inc.
10. Lenoir Mirror Co.
11. Messer Industries
12. Stroupe Mirror Co.
13. Texas Mirror, Inc.
14. Virginia Mirror Co., Inc.
15. Weaver Mirrors, Inc.

2.2 GLASS FOR MIRROR PRODUCTION

A. Primary Glass: Float glass complying with ASTM C 1036 requirements for Type I (transparent, flat) and for class and quality indicated below:

1. Clear Float Glass: Quality q2 (mirror), Class 1 (clear).

2.3 MIRRORED GLASS PRODUCTION AND FABRICATION

A. Glass Coating: Coat second surface of glass with successive layers of chemically deposited silver, electrically or chemically deposited copper, and manufacturer's standard protective organic coating to produce coating system that complies with FS DD-M-0041, except with salt-spray test period extended to 300 hours and undercutting, discolorations, blackening, and silver impairment at mirror edges not greater than \(\frac{1}{8}\) inch (3 mm).

B. Mirror Sizes: After application of glass coating, cut mirrored glass to final sizes and in the following nominal glass thickness:

1. Thickness: 5 mm.

C. Mirror Edge Treatment: Provide forms of edge treatment indicated below, with edges sealed after treatment to prevent chemical or atmospheric penetration of glass coating:

1. Flat polished edge.
2.4 MISCELLANEOUS MATERIALS

A. Setting Blocks: Neoprene, 70 - 90 Shore A hardness.

B. Edge Sealer: A coating that has proven to be compatible with glass coating and approved by mirrored glass manufacturer for use in protecting against silver deterioration at mirror edges.

C. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrors by spot application, certified as compatible with glass coating by organic protective coating manufacturer and approved by mirror manufacturer.

D. Mirror Hardware: Extruded aluminum mirror hardware, of size and profile indicated, in manufacturer's standard finish, complying with description below:

   1. Clear anodized finish.

E. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture.

F. Anchors and Inserts: Provide devices as required for installation of mirror hardware. Provide toothed or lead-shield expansion bolt devices for drilled-in-place anchors. Provide galvanized or cadmium-coated anchors and inserts for applications on inside face of exterior walls and where indicated.

PART 3 – EXECUTION

3.1 GLAZING

A. General: Install mirrors to comply with printed directions of mirror manufacturer, and with referenced FGMA standard and NAMM document. Mount mirrors in place to avoid distorting reflected images and provide space for air circulation between back of mirror and face of mounting surface.

B. Mastic Spot Installation System: Install mirrors with mastic as follows:

   1. Identify and examine surfaces over which mirror is to be mounted. Comply with manufacturer's printed installation directions for preparation of mounting surfaces including coating surfaces with mastic manufacturer's special bond coating where applicable.
   2. Apply barrier coat to mirror backing where approved by manufacturers of mirror and backing material.
   3. Apply mastic in spots to comply with mastic manufacturer's printed directions for coverage and to allow air circulation between back of mirror and face of mounting surface.
4. After mastic is applied, align mirror and press into place while maintaining a minimum air space of 3/16 inch (5 mm) between back of mirror and mounting surface.

5. For wall-mounted mirrors install permanent means of support at bottom and top edges with bottom support designed to withstand mirror weight and top support to prevent mirror from coming away from wall along top edges.
   a. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable.
   b. Provide continuous bottom supports, provide 1/8 x 4-inch (3 x 100-mm) setting blocks at quarter points. For channels or other continuous supports in which water could be trapped, provide two 1/4-inch (6-mm) diameter weeps drilled between setting blocks.
   c. For wall application provide clips along top of mirror.

3.2 PROTECTION AND CLEANING

A. Protect mirrored glass from breakage and contaminating substances resulting from construction operations.

B. Do not permit edges of mirror to be exposed to standing water.

C. Maintain environmental conditions that will prevent mirror from being exposed to moisture from condensation or other sources for continuous periods of time.

D. Wash mirrors not more than 4 days prior to date scheduled for inspections intended to establish date for Substantial Completion. Wash glass by methods recommended in NAMM document and by mirrored glass manufacturer. Use water or glass cleaners free from substances capable of damaging mirror edges or glass coating.

END OF SECTION 08830
SECTION 09255 - 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 wood framing members for gypsum board assemblies.
   2. Gypsum board assemblies attached to wood framing.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 6 Section "Rough Carpentry" for wood framing and blocking.
   2. Division 7 Section “Joint Sealants”.

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: none

1.5 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.

1.6 QUALITY ASSURANCE

A. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
B. 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.

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 (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) 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. Gypsum Board and Related Products:
   a. Domtar Gypsum.
   b. Georgia-Pacific Corp.
   c. National Gypsum Co.; Gold Bond Building Products Division.
   d. United States Gypsum Co.

2.2 GYPSUM BOARD PRODUCTS
A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.

1. Widths: Provide gypsum board in widths of 48 inches (1219 mm).

B. Gypsum Wallboard: ASTM C 36 and as follows:

1. Type: Regular for vertical surfaces, unless otherwise indicated.
2. Type: Type X where required for fire-resistance-rated assemblies.
3. Type: Sag-resistant type for ceiling surfaces.
5. Thickness: 5/8 inch (15.9 mm) where indicated.

2.3 TRIM ACCESSORIES

A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal or plastic, with metal complying with the following requirement:
   d. Steel sheet zinc coated by hot-dip process or rolled zinc.
2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
   d. Cornerbead on outside corners, unless otherwise indicated.
   e. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
   f. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
   g. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
   h. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

2.4 JOINT TREATMENT MATERIALS

A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.

C. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.

   a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
2.5 ACOUSTICAL SEALANT

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:

1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

B. Available Products: Subject to compliance with requirements, acoustical sealants that may be incorporated in the Work include, but are not limited to, the following:

1. Acoustical Sealant for Exposed and Concealed Joints:
   a. PL Acoustical Sealant; ChemRex, Inc.; Contech Brands.
   b. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.
   c. SHEETROCK Acoustical Sealant; United States Gypsum Co.

2.6 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. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum panels to steel framing.

D. Steel drill screws complying with ASTM C 1002 for the following applications:
1. Fastening gypsum board to steel members less than 0.033 inch (0.84 mm) thick.

E. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

F. Steel drill screws of size and type recommended by unit manufacturer for fastening cementitious backer units.

G. Foam Gaskets: Closed-cell vinyl foam adhesive-backed strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit metal stud size indicated.
H. Sound-Attenuation Blankets: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing).

1. Mineral-Fiber Type: Fibers manufactured from glass.

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 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

A1 Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.

B1 Install sound-attenuation blankets, where indicated, prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

C1 Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

D1 Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

E1 Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

F1 Attach gypsum panels to steel studs so leading edge or end of each panel is attached to
open (unsupported) edges of stud flanges first.

G1 Attach gypsum panels to framing provided at openings and cutouts.

H1 Spot grout hollow metal door frames for solid-core wood doors, hollow metal doors, and doors over 32 inches (813 mm) wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.

I1 Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.

2c Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.

3c Fit gypsum panels around ducts, pipes, and conduits.

4c Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by joists, and other structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

J0 Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

K0 Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

L0 Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

1c Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.

M0 Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

3.3 GYPSUM BOARD APPLICATION METHODS

A0 Single-Layer Application: Install gypsum wallboard panels as follows:

1c On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.

2c On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.
3.4 INSTALLING TRIM ACCESSORIES

A0 General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

B0 Install cornerbead at external corners.

C0 Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.

1c Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.

2c Install L-bead where edge trim can only be installed after gypsum panels are installed.

3c Install U-bead where indicated.

D0 Install control joints according to ASTM C 840 and manufacturer's recommendations and in specific locations approved by Architect for visual effect.

1. Provide control joints at all hollow metal frames located in continuous gypsum board walls (such as corridors). Locate control joint at top corners of frame (both sides) and extend 4” above ceiling elevation.

3.5 FINISHING GYPSUM BOARD ASSEMBLIES

A0 General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.

B0 Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.

C0 Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.

1c Level 1 for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.

2c Level 4 for exposed gypsum board surfaces, unless otherwise indicated.

D0 Use the following joint compound combination as applicable to the finish levels specified:

1c Embedding and First Coat: Ready-mixed, drying-type, all-purpose or taping compound. Fill (Second) Coat: Ready-mixed, drying-type, all-purpose or topping compound. Finish (Third) Coat: Ready-mixed, drying-type, all-purpose or topping
compound.

E0 For Level 4 gypsum board finish, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects and ready for decoration.

F0 Where Level 1 gypsum board finish is indicated, embed tape in joint compound.

3.6 CLEANING AND PROTECTION

A0 Promptly remove any residual joint compound from adjacent surfaces.

B0 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 09255
SECTION 09511 - ACOUSTICAL PANEL CEILINGS

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 ceilings consisting of acoustical panels and exposed suspension systems.

1.3 SUBMITTALS

A. Product Data: For each type of product specified.
B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
0. Ceiling suspension system members.
1. Method of attaching suspension system hangers to building structure.
2. Ceiling-mounted items including light fixtures; air outlets and inlets; speakers; sprinklers; and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
C. Samples for Initial Selection: Manufacturer's color charts consisting of actual acoustical panels or sections of acoustical panels, suspension systems, and moldings showing the full range of colors, textures, and patterns available for each type of ceiling assembly indicated.
D. Samples for Verification: Full-size units of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
1. 6-inch- (150-mm-) square samples of each acoustical panel type, pattern, and color.
2. Full-size samples of each acoustical panel type, pattern, and color.
3. Set of 12-inch- (300-mm-) long samples of exposed suspension system members, including moldings, for each color and system type required.
E. Qualification Data: 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.

F. Product Test Reports: Indicate compliance of acoustical panel ceilings and components
with requirements based on comprehensive testing of current products.

G. Research/Evaluation Reports: Evidence of acoustical panel ceiling's and components'
compliance with building code in effect for Project, from a model code organization
acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed acoustical
panel ceilings similar in material, design, and extent to that indicated for this Project and
with a record of successful in-service performance.

B. Source Limitations for Ceiling Units: Obtain each acoustical ceiling panel from one source
with resources to provide products of consistent quality in appearance and physical
properties without delaying the Work.

C. Source Limitations for Suspension System: Obtain each suspension system from one
source with resources to provide products of consistent quality in appearance and physical
properties without delaying the Work.
1. Obtain both acoustical ceiling panels and suspension system from the same
manufacturer.

D. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the
following requirements:
1. Fire-response tests were performed by UL, ITS/Warnock Hersey, or another
independent testing and inspecting agency that is acceptable to authorities having
jurisdiction and that performs testing and follow-up services.
2. Surface-burning characteristics of acoustical panels comply with ASTM E 1264 for
Class A materials as determined by testing identical products per ASTM E 84.
3. Fire-resistance-rated assemblies, which are indicated by design designations from
UL's "Fire Resistance Directory," from ITS/Warnock Hersey's "Directory of Listed
Products," or from the listings of another testing and inspecting agency, are identical
in materials and construction to those tested per ASTM E 119.
4. Products are identified with appropriate markings of applicable testing and
inspecting agency.

E. Preinstallation Conference: Conduct conference at Project site to comply with
requirements of Division 1 Section "Project Meetings."

1.5 DELIVERY, STORAGE, AND HANDLING
A. Deliver acoustical panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.6 PROJECT CONDITIONS
A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 COORDINATION
A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.8 EXTRA MATERIALS
A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
1. Acoustical Ceiling Units: Full-size units equal to 2.0 percent of amount installed.
2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, those indicated for each designation in the Acoustical Panel Ceiling Schedule at the end of Part 3.
B. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Acoustical Panel Ceiling Schedule at the end of Part 3.

2.2 ACOUSTICAL PANELS, GENERAL
A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
   1. Mounting Method for Measuring Noise Reduction Coefficient: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.

B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
   1. Where appearance characteristics of acoustical panels are indicated by referencing ASTM E 1264 pattern designations and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range of products that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

C. Antimicrobial Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial solution consisting of a synergistic blend of substituted ammonium salts of alkylated phosphoric acids admixed with free alkylated phosphoric acid that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria.

D. Panel Characteristics: Comply with requirements indicated in the Acoustical Panel Ceiling Schedule at the end of Part 3, including those referencing ASTM E 1264 classifications.

2.3 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.

B. Metal Suspension System Characteristics: Comply with requirements indicated in the Acoustical Panel Ceiling Schedule at the end of Part 3.

C. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
   1. Postinstalled Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:


3. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.

E. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

F. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

G. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.

H. Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material and finish as that used for exposed flanges of suspension system runners.
   1. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
   2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
   3. For narrow-face suspension systems, provide suspension system and manufacturer's standard edge moldings that match width and configuration of exposed runners.

I. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's product designations, including splice plates, corner pieces, and attachment and other clips, complying with the following requirements:
   1. Aluminum Alloy: 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 properties of aluminum extrusions complying with ASTM B 221/B 221M for alloy and temper 6063-T5.
   2. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.
   3. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.
a. Organic Coating: Manufacturer's standard thermosetting coating system with a minimum dry film thickness of 0.8 to 1.2 mils (0.02 to 0.03 mm).
b. Color: As selected by Architect from manufacturer's standard colors.
c. Color: Match color indicated by referencing manufacturers' standard color designations.
d. Color: Match color of finish on flanges of suspension system surfaces.
e. Color: Match Architect's sample.

5. 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:
6. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
   a. Armstrong World Industries, Inc.
   b. Celotex Corporation (The); Building Products Division; Architectural Ceilings Marketing Dept.
   c. Chicago Metallic Corporation.
   d. Fry Reglet Corporation.
   e. Gordon, Inc.
   f. MM Systems, Inc.
   g. USG Interiors, Inc.

2.4 ACOUSTICAL SEALANT

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:

   1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

B. Acoustical Sealant for Concealed Joints: Manufacturer’s standard nondrying, nonhardening, nonhardening, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

C. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

D. Products: Subject to compliance with requirements, provide one of the following:

   1. Acoustical Sealant for Exposed and Concealed Joints:
      a. PL Acoustical Sealant; Chemrex, Inc., Contech Brands.
      b. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.
      c. SHEETROCK Acoustical Sealant; United States Gypsum Co.

   2. Acoustical Sealant for Concealed Joints:
a. BA-98; Pecora Corp.
b. Tremco Acoustical Sealant; Tremco, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and other conditions affecting performance of acoustical panel ceilings.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with publications referenced below per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."


B. Suspend ceiling hangers from building's 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 structure or of ceiling suspension
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings 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 and publications.

5. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

6. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

7. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, powder-actuated fasteners, or drilled-in anchors that extend through forms into concrete.

8. Do not attach hangers to steel deck tabs.

9. Do not attach hangers to steel roof deck. Attach hangers to structural members.

10. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 inches (200 mm) from ends of each member.

11. Provide wire hangers at corners of ceiling grid which is to hold 2’x4’ florescent light Fixtures.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building’s structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3 mm in 3.6 m). Miter corners
accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. Arrange directionally patterned acoustical panels as follows:
   a. As indicated on reflected ceiling plans.
   b. Install panels with pattern running in one direction parallel to long axis of space.
   c. Install panels with pattern running in one direction parallel to short axis of space.
   d. Install panels in a basket-weave pattern.
2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
3. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
4. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.
5. Paint cut panel edges remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
6. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated or required.
7. Install clean-room gasket system in areas indicated, sealing each panel and fixture as recommended by panel manufacturer's written instructions.
8. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.4 FIELD QUALITY CONTROL
A. Testing Agency: Owner will engage a qualified independent testing agency to perform field quality-control testing.

B. Extent and Testing Frequency: Testing will take place in successive stages in areas described below. Proceed with installation of acoustical panel ceilings only after test results for previously installed hangers comply with requirements.

9. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed.
10. Within each test area, testing agency will select one of every 10 powder-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test
them for 200 lbf (890 N) of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf (1957 N) of tension.

11 When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 consecutively pass and then will resume initial testing frequency.

C Testing agency will report test results promptly and in writing to Contractor and Architect.

D Remove and replace those fasteners and anchors that test results indicate do not comply with specified requirements.

E Additional Testing: Where fasteners and anchors are removed and replaced, additional testing will be performed to determine compliance with specified requirements.

3.5 CLEANING

A Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.6 ACOUSTICAL PANEL CEILING SCHEDULE

A Non-Sag Mineral-Base Acoustical Panels for Acoustical Panel Ceiling Color-White (Type "A") 2'x2' x 5/8"

b. Armstrong World Industries, Inc. #1729
b. Celotex Ceiling Tile Model Hytone-Vantage 10
c. USG #990

B Wide-Face, Single-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet electrolytically zinc coated, with prefinished 15/16-inch- (24-mm-) wide flanges; other characteristics as follows: Color White

a Structural Classification: Intermediate-duty system.
b Face Finish: White.

C USG Donn DX Grid (White)

END OF SECTION 09511
SECTION 09653 - RESILIENT WALL BASE AND ACCESSORIES

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. Resilient wall base.
2. Resilient flooring accessories.

B. Related Sections include the following:

1. Division 9 Section "Resilient Tile Flooring."

1.3 SUBMITTALS

A. Product Data: For each type of product specified.

B. Samples for Initial Selection: Manufacturer's standard sample sets consisting of sections of units showing the full range of colors and patterns available for each type of product indicated.

C. Samples for Verification: In manufacturer's standard sizes, but not less than 12 inches (300 mm) long, of each product color and pattern specified.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing resilient products similar to those required for this Project and with a record of successful in-service performance.

B. Source Limitations: Obtain each type and color of product specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
C. Fire-Test-Response Characteristics: Provide products with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Critical Radiant Flux: 0.45 W/sq. cm or greater when tested per ASTM E 648.
2. Smoke Density: Maximum specific optical density of 450 or less when tested per ASTM E 662.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Project site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 50 and 90 deg F (10 and 32 deg C).

C. Move products into spaces where they will be installed at least 48 hours before installation, unless longer conditioning period is recommended in writing by manufacturer.

1.6 PROJECT CONDITIONS

A. Maintain a temperature of not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C) in spaces to receive resilient products for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After postinstallation period, maintain a temperature of not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

B. Do not install products until they are at the same temperature as the space where they are to be installed.

C. For resilient products installed on traffic surfaces, close spaces to traffic during installation and for time period after installation recommended in writing by manufacturer.

D. Coordinate resilient product installation with other construction to minimize possibility of damage and soiling during remainder of construction period. Install resilient products after other finishing operations, including painting, have been completed.
1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

1. Furnish not less than 10 linear feet (3 linear m) for each 500 linear feet (150 linear m) or fraction thereof, of each different type, color, pattern, and size of resilient product installed.
2. Deliver extra materials to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, those indicated in the Resilient Wall Base and Accessory Schedule at the end of Part 3.

2.2 RESILIENT WALL BASE

A. Vinyl Wall Base: Products complying with FS SS-W-40, Type II and with requirements. Outside corners only

2.3 RESILIENT ACCESSORIES

A. Rubber Accessories: Products complying with requirements specified in the Resilient Wall Base and Accessory Schedule.
B. Vinyl Accessories: Products complying with requirements specified in the Resilient Wall Base and Accessory Schedule.

2.4 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by resilient product manufacturer for applications indicated.
B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where installation of resilient products will occur, with Installer present, for compliance with manufacturer's requirements, including those for maximum moisture content. Verify that substrates and conditions are satisfactory for resilient product installation and comply with requirements specified. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with manufacturer's written installation instructions for preparing substrates indicated to receive resilient products.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.

C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

D. Broom and vacuum clean substrates to be covered immediately before installing resilient products. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. General: Install resilient products according to manufacturer's written installation instructions.

B. Apply resilient wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

1. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
2. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
3. Do not stretch base during installation.
4. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
5. Install premolded outside and inside corners before installing straight pieces.
6. Manufactured outside corners required.
7. Form inside corners on job, from straight pieces of maximum lengths possible, by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

C. Place resilient products so they are butted to adjacent materials and bond to substrates with adhesive. Install reducer strips at edges of flooring that would otherwise be exposed.

3.4 CLEANING AND PROTECTING

A. Perform the following operations immediately after installing resilient products:

1. Remove adhesive and other surface blemishes using cleaner recommended by resilient product manufacturers.
2. Sweep or vacuum horizontal surfaces thoroughly.
3. Do not wash resilient products until after time period recommended by resilient product manufacturer.
4. Damp-mop or sponge resilient products to remove marks and soil.

B. Protect resilient products against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by resilient product manufacturer.

1. Apply protective floor polish to vinyl resilient products installed on floors and stairs that are free from soil, visible adhesive, and surface blemishes, if recommended by manufacturer.
   a. Use commercially available product acceptable to resilient product manufacturer.
   b. Coordinate selection of floor polish with Owner's maintenance service.
2. Cover resilient products installed on floors and stairs with undyed, untreated building paper until inspection for Substantial Completion.

C. Clean resilient products not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products according to manufacturer's written recommendations.
1. Before cleaning, strip protective floor polish that was applied to vinyl products on floors and stairs after completing installation only if required to restore polish finish and if recommended by resilient product manufacturer.

2. After cleaning, reapply polish on vinyl products on floors and stairs to restore protective floor finish according to resilient product manufacturer's written recommendations. Coordinate with Owner's maintenance program.

3.5 RESILIENT WALL BASE AND ACCESSORY SCHEDULE

A. Vinyl Wall Base: Provide vinyl wall base complying with the following:

1. Available Products: As follows:

   a. Jet Cove Base, Afco; Vinyl Cove Base, Flexco; Kencove Wall Base, Kentile; Fashion Cove, Tarkett.

2. Color and Pattern: As selected by Architect from manufacturer's full range of colors and patterns produced for vinyl wall base complying with requirements indicated.


4. Minimum Thickness: 1/8 inch (3.2 mm).

5. Height: 4 inches (101.6 mm).

6. Lengths: Coils in lengths standard with manufacturer, but not less than 96 feet (29.26 m).

7. Outside Corners: Premolded

8. Inside Corners: formed on job.


B. Rubber Stair Treads and Accessories: Provide rubber stair treads and accessories complying with the following:

1. Available Products:

   a. Flexco Heavy Duty Radial II, Type 700 or approved equal.

2. Color and Pattern: As specified by product designation indicated above.

C. Vinyl Accessory Molding: Provide vinyl accessory molding complying with the following:

1. Color: As selected by Architect from manufacturer's full range of colors produced for vinyl accessory molding complying with requirements indicated.

2. Product Description: Reducer strip for resilient flooring.
3. Profile and Dimensions: As required to suit conditions.

END OF SECTION 09653
SECTION 09900 - PAINTING

1.0 PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

Extent of painting work is indicated on drawings and schedules, and as herein specified.

Work includes painting and finishing of interior and exterior exposed items and surfaces throughout project, except as otherwise indicated.

Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.

"Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not be be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these from standard colors or finishes available.

Following categories of work are not included as part of field-applied finish work.

Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer-finishing is specified for such items as (but not limited to) metal toilet enclosures, prefinished partition systems, acoustic materials, elevator entrance doors and frames, elevator equipment, and finished mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.

Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.

Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.

Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will
not require finish painting.

Following categories of work are included under other sections of these specifications.

**Shop Priming:** Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work and similar items.

Unless otherwise specified, shop priming of fabricated components such as architectural woodwork, wood casework, flush wood doors and shop-fabricated or factory-built mechanical and electrical equipment or accessories is included under other sections of these specifications.

Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 **QUALITY ASSURANCE:**

**Single Source Responsibility:** Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

**Coordination of Work:** Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

1.4 **SUBMITTALS:**

**Product Data:** Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use. Submit manufacturer's color selection chip book for each type of paint specified.

**Samples:** Prior to beginning work, Architect will furnish color chips for surfaces to be painted. Use representative colors when preparing samples for review. Submit samples for Architect's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.

On actual wall surfaces and other exterior and interior building components, duplicate painted finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface, as directed, until required sheen, color and texture is obtained; simulate finished lighting conditions for review of in-place work.

Final acceptance of colors will be from samples applied on the job.

1.5 **DELIVERY AND STORAGE:**

Deliver materials to job site in original, new and unopened packages and containers bearing
manufacturer's name and label, and following information:

Name or title of material.
Fed. Spec. number, if applicable.
Manufacturer's stock number and date of manufacturer.
Manufacturer's name.
Contents by volume, for major pigment and vehicle constituents.
Thinning instructions.
Application instructions.
Color name and number.

Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.

Protect from freezing where necessary. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all precautions to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

1.6 JOB CONDITIONS:

Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 deg. F (10 deg. C) and 90 deg. F (32 deg. C), unless otherwise permitted by paint manufacturer's printed instructions.

Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 deg. F (7 deg. C) and 95 deg. F (35 deg. C), unless otherwise permitted by paint manufacturer's printed instructions.

Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.

Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

2.0 PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include; but are not limited to, the following:

Devoe and Reynolds Co. (Devoe).
Glidden Coatings and Resins, Division of SCM Corporation (Glidden).
Benjamin Moore and Co. (Moore).
PPG Industries, Pittsburgh Paints (Pittsburgh).
Pratt and Lambert (P & L).
The Sherwin-Williams Company (S-W).

2.2 MATERIALS:

Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.

Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

3.0 PART 3 - EXECUTION

3.1 INSPECTION:

Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator.

Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.
Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION:

General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.

Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.

Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.

Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease
prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.

**Cementitious Materials:** Prepare cementitious surfaces of concrete, concrete block, cement plaster and cement-asbestos board to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.

Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner. Flush floor with clean water to neutralize acid, and allow to dry before painting.

**Wood:** Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.

Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, paneling.

When transparent finish is required, use spar varnish for backpriming.

Backprime paneling on interior partitions only where masonry, plaster, or other wet wall construction occurs on backside.

Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

**Ferrous Metals:** Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.

**Touch-up shop-applied prime coats** wherever damaged or bare, where required by other sections of these specifications. Clean and touch-up with same type shop primer.

**Galvanized Surfaces:** Clean free of oil and surface contaminants with non-petroleum based solvent.

3.3 **MATERIALS PREPARATION:**
Mix and prepare painting materials in accordance with manufacturer's directions.

Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3.4 APPLICATION:

General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

Surface treatments, and finishes, are indicated in "schedules" of the contract documents.

Provide finish coats which are compatible with prime paints used.

Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.

Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint. (sprinkler room only in building shell contract)

Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.

Finish exterior doors on tops, bottoms and side edges same as exterior faces, unless otherwise indicated.

Sand lightly between each succeeding enamel or varnish coat.

Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint
has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

**Minimum Coating Thickness:** Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

**Mechanical and Electrical Work:** Painting of mechanical and electrical work is limited to those items exposed in occupied spaces.

**Prime Coats:** Apply prime coat of material which is required to be painted or finished, and which has not been prime coated by others.

Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

**Stipple Enamel Finish:** Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.

**Pigmented (Opaque) Finishes:** Completely cover to provide an opaque, smooth 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.

**Completed Work:** Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

### 3.5 CLEAN-UP AND PROTECTION:

**Clean-Up:** During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.

Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

**Protection:** Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.
3.6 **EXTERIOR PAINT SCHEDULE:**

**General:** Provide the following paint systems for the various substrates, as indicated.

3.6.1 **Ferrous Metal:**

- **Full Gloss Alkyd Enamel:** 2 Finish coats over primer.
- **Prime Coat:** Red Primer (FS TT-P-86). Primer is not required on items delivered shop primed.
- **First and Second Finish Coats:** High Gloss Alkyd Enamel (FS TT-E-489).

3.6.2 **Zinc-Coated Metal:**

- **High Gloss Alkyd Enamel:** 2 Finish coats over primer.
- **Prime Coat:** Zinc Dust-Zinc Oxide Primer.
- **First and Second Finish Coats:** Semi-Gloss Alkyd Enamel.

3.6.3 **Fiber Cement Siding:**

Sherwin Williams products or equal as follows:

- **First and Second Finish Coats over primer:** Semi-Gloss Alkyd Enamel.

3.7 **INTERIOR PAINT SCHEDULE:**

**General:** Provide the following paint systems for the various substrates, as indicated.

3.7.1 **Gypsum Drywall Systems:**

- **Odorless Eggshell Alkyd Enamel Finish:** 1 coat with total dry film thickness not less than 1.25 mils.
- **First Coat:** Interior Latex Base Primer Coat.
- **Second and Third Coats:** Odorless Interior Eggshell Alkyd Enamel.

3.7.2 **Ferrous Metal:**

- **Full Gloss Enamel Finish:** 2 Coats over primer with total dry film thickness not less than 2.5 mils.
- **Prime Coat:** Red Primer. Prime coat is not required on items delivered shop primed.
**First Coat**: Interior Enamel Undercoat.

**Third Coat**: Alkyd Gloss Enamel.

END OF SECTION 09900
SECTION 10425 - SIGNS

1.1 GENERAL

A. Submittals: Submit the following:

1. Shop Drawings: Provide plans, elevations, and sections showing typical members, anchors, layout, reinforcement, accessories, and installation details.

2. Samples: For initial selection of color, pattern, and surface texture, and for verification of compliance with requirements indicated.

1.2 PRODUCTS

A. Acrylic Sheet: Cast methyl methacrylate monomer plastic sheet with 16,000-psi minimum flexural strength, and minimum allowable continuous service temperature of 176 deg F (80 deg C).

1. Transparent Sheet: Matte finish, clear colorless sheet with 92 percent light transmittance.

2. Opaque Sheet: Colored opaque acrylic sheet in colors and finishes indicated.

B. Vinyl Film: Opaque nonreflective vinyl film, 0.0035-inch minimum, pressure-sensitive adhesive backing, suitable for exterior use.

C. ABS Plastic: Provide high-impact thermoplastic composed of copolymers of acrylonitrile, butadiene, and styrene.

D. Colored Coatings for Acrylic Plastic Sheet: Nonfading colored coatings, including inks and paints for copy and background colors.

E. Panel Signs: Comply with requirements for materials, thicknesses, finishes, colors, designs, shapes, sizes, and construction details. Produce smooth, even, level sign panel surfaces.

1. Unframed Panel Signs shall be manufactured by Diskey Sign Corporation, (800) 669-4472, or approved equal. Provide the following:

a. ADA Accessible Restroom sign. Quantity 3

F. Graphic Content and Style: Provide sign copy that complies with size, style, spacing, content, position, material, finishes, and colors of letters, numbers, and other graphic devices.

1. The Owner will determine exact content of text for each sign panel.
1.3 EXECUTION

A. Installation: Locate signs where directed by Architect, using mounting methods specified. Install level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.

B. Wall-Mounted Panel Signs: Attach using methods indicated below:

C. Cleaning: After installation, clean soiled surfaces. Protect units from damage until acceptance by the Owner.

END OF SECTION 10425
SECTION 10522 - FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

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. Fire extinguishers.
2. Fire extinguisher mounting brackets.

1.3 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain extinguishers and cabinets from one source from a single manufacturer.
B. Coordination: Verify that cabinets are sized to accommodate type and capacity of extinguishers indicated and provided by Owner under separate Contract.
C. UL-Listed Products: Fire extinguishers shall be UL listed with UL listing mark for type, rating, and classification of extinguisher.

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. Ansul Fire Protection.
2. Badger-Powhatan.
3. American Specialties Inc.
5. Croker Div., Fire-End and Croker Corp.
6. Filtrine Manufacturing.
7. Lyon Metal Products.
8. J.L. Industries.
10. Modern Metal Products by Muckle.
11. Potter-Roemer, Inc.
12. Samson Metal Products, Inc.

2.2 FIRE EXTINGUISHERS
   A. General: Provide fire extinguishers for each cabinet and other locations indicated, in colors and finishes selected by Architect from manufacturer's standard, that comply with authorities having jurisdiction.
   
   B. Dry Chemical Type: UL-rated 40-B:C, 10-lb nominal capacity, in enameled steel container.

       1. Provide unit on wall hanger bracket at the following locations:

           Recreation Room 101
           Storage Room 102

2.3 MOUNTING BRACKETS
   A. Wall Hanger Brackets: Designed to prevent accidentally dislodging extinguisher, of sizes required for type and capacity of extinguisher indicated, in plated finish.
   
   B. Identify bracket-mounted extinguishers with FIRE EXTINGUISHER in red letter decals applied to wall surface. Use letter size, style, and location as selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

   Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

   A. Follow manufacturer's printed instructions for installation.
   
   B. Install in locations and at mounting heights indicated or, if not indicated, at heights to comply with applicable regulations of governing authorities.
      Fasten mounting brackets and cabinets to structure, square and plumb.
END OF SECTION 10522
SECTION 10800 - TOILET AND BATH ACCESSORIES

1.0 PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

Extent of each type of toilet accessory is indicated on drawings and schedules.

Types of toilet accessories required are as listed in the toilet accessory schedule at the end of this section.

1.3 QUALITY ASSURANCE:

Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.

Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

1.4 SUBMITTALS:

Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory.

Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices and cut-out requirements in other work.

2.0 PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:
Available Manufacturers: Subject to compliance with requirements, manufacturers offering toilet accessories which may be incorporated in the work include, but are not limited to, the following:

Bobrick Washroom Equipment, Inc.
A & J Washroom Accessories.
American Specialties, Inc.
Bradley Corporation.
Franklin Brass Mfg. Co.
G. M. Ketcham Co., Inc.
McKinney/Subsidiary Kidde, Inc.
Parker-Scovill.
Watrous, Inc.

2.2 MATERIALS, GENERAL:

Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gage (.034”) minimum, unless otherwise indicated.

Brass: Leaded and unleaded, flat products, FS QQ-B-613; Rods, shapes, forgings, and flat products with finished edges, FS QQ-B-626.

Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 20-gage (.040”) minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.

Galvanized Steel Sheet: ASTM A 527, G60.

Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.

Baked Enamel Finish: Factory-applied, gloss white, baked acrylic enamel coating.


Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

2.3 TOILET ACCESSORIES

The following toilet accessory catalog numbers are, unless noted otherwise, that of Bobrick Washroom Equipment, Inc. and are intended to establish the standard of quality and type of toilet accessories required. Subject to compliance with requirements, other manufacturers products may be used.

Recessed Paper Towel Dispenser/Waste Receptacle:
B-380328. Mount top of unit at 60” a.f.f.

Toilet Tissue Dispenser:

B-288. Mount below grab bar (if any) at centerline 1”-7” a.f.f.

Wall Mounted Soap Dispenser: B-4112

Mirror with Stainless Steel Frame:

B-165 1830. Mount bottom at 40”a.f.f.

Grab Bar:

B-5837 (36" x 54" x 1-1/4" diameter). Mount at 36" a.f.f. Provide concealed steel anchor plates and concealed mounting as recommended by manufacturer for wall type to which bar is to be installed. (Note: Contractor may provide two piece grab bars, 36” x 42”, at contractor’s option).

2.4 FABRICATION:

General: Only an unobtrusive stamped logo of manufacturer, as approved by Architect, is permitted on exposed face of toilet or bath accessory units. On either interior surface not exposed to view or back surface, provide additional identification by means of either a printed, waterproof label or a stamped nameplate, indicating manufacturer's name and product model number.

Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.

Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage which is fully concealed when unit is closed.

3.0 PART 3 - EXECUTION

3.1 INSTALLATION:

Install toilet accessory units in accordance with manufacturers' instructions, using fasteners
which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.

3.2 ADJUSTING AND CLEANING:

Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

Clean and polish all exposed surfaces after removing temporary labels and protective coatings.

3.3 TOILET ACCESSORY SCHEDULE

Provide the following toilet accessories for each space as listed below. Toilet accessory catalog numbers are, unless noted otherwise, that of Bobrick Washroom Equipment, Inc. and are intended to establish the standard of quality and type of toilet accessories required. Subject to compliance with requirements, other manufacturers products may be used.

Locate toilet accessories as specified in Section 10800, as indicated on plans or if not indicated, as directed by Architect.

TOILET ACCESSORY SCHEDULE

<table>
<thead>
<tr>
<th>AREAS</th>
<th>QTY (Each Space)</th>
<th>ITEM</th>
<th>CATALOG NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restroom 103</td>
<td>1</td>
<td>Paper Towel Dispenser/Waste Receptacle</td>
<td>B-380328</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Toilet Tissue Dispenser</td>
<td>B-288</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Wall Mounted Soap Dispenser</td>
<td>B-4112</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Grab Bar Set</td>
<td>B-5837</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Sanitary Napkin Disposal</td>
<td>B-270</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Wall Mirror (see Section 08830)</td>
<td></td>
</tr>
</tbody>
</table>

END OF SECTION 10800
SECTION 06192 - METAL-PLATE-CONNECTED WOOD TRUSSES

1PART - 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. Girder trusses.
2. Truss accessories.

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

1. Division 6 Section "Rough Carpentry" for roof and floor sheathing of structural-use panels and dimension lumber for supplementary framing and permanent bracing.

1.3 DEFINITIONS

A. Metal-plate-connected wood trusses include planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Engineer, fabricate, and erect metal-plate-connected wood trusses to withstand design loads within limits and under conditions required.

1. Design Loads: As indicated.
2. Design trusses to withstand design loads without deflections greater than the following:

   a. Roof Trusses: Vertical deflection of 1/240 of span due to total load.
   b. Roof Trusses: Horizontal deflection at reactions of 1-1/4 inches due to total load.

B. Engineering Responsibility: Engage a fabricator who uses a qualified professional engineer to prepare calculations, Shop Drawings, and other structural data for metal-plate-connected wood trusses.

1.5 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 lumber, metal-plate connectors, metal framing connectors, bolts, and fasteners.

C. Shop Drawings detailing location, pitch, span, camber, configuration, and spacing for each type of truss required; species, sizes, and stress grades of lumber to be used; splice details; type, size, material, finish, design values, and orientation and location of metal connector plates; and
bearing details.

1. To the extent truss design considerations are indicated as fabricator's responsibility, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

2. Include truss Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.

D. Product certificates signed by officer of truss fabricating firm certifying that metal-plate-connected wood trusses supplied for Project comply with specified requirements and Shop Drawings.

E. Qualification data 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.

F. Material test reports from a qualified independent testing agency indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated.

G. Warranty of chemical treatment manufacturer for each type of treatment.

H. 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 American Lumber Standards Committee (ALSC) Board of Review.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed wood truss installation similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Fabricator's Qualifications: Engage a firm that complies with the following requirements for quality control and is experienced in fabricating metal-plate-connected wood trusses similar to those indicated for this Project and with a record of successful in-service performance:

C. Comply with applicable requirements and recommendations of the following publications:

1. ANSI/TP1 1, "National Design Standard for Metal-Plate-Connected Wood Truss Construction."
2. TPI HIB "Commentary and Recommendations for Handling Installing & Bracing Metal Plate Connected Wood Trusses."
3. TPI DSB "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."

D. Metal-Plate Connector Manufacturer's Qualifications: A manufacturer that is a member of TPI and that complies with TPI quality-control procedures for manufacture of connector plates published in ANSI/TP1 1.

E. Single-Source Responsibility for Connector Plates: Provide metal connector plates from one source and by a single manufacturer.

G. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated that have resulted in installing metal-plate-connected wood trusses similar to those indicated for this Project and with a record of successful in-service performance.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Handle and store trusses with care and comply with manufacturer's written instructions and TPI recommendations to avoid damage and lateral bending.

B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

1.8 SEQUENCING AND SCHEDULING

A. Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying progress of other trades whose work must follow erection of trusses.

2 PART - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Metal Connector Plates:
   a. Alpine Engineered Products, Inc.
   b. Computrus, Inc.
   c. Mitek Industries, Inc.
   d. Robbins Manufacturing Company.
   e. Tee-Lok Corporation.
   f. Truswal Systems Corporation.

2. Metal Framing Anchors:
   a. Cleveland Steel Specialty Co.
   b. Harlen Metal Products, Inc.
   c. Silver Metal Products, Inc.
   d. Simpson Strong-Tie Company, Inc.
   e. Southeastern Metals Manufacturing Co., Inc.
   f. United Steel Products Co.

2.2 DIMENSION LUMBER

B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:

1. SPIB - Southern Pine Inspection Bureau.

C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

D. Provide dressed lumber, S4S, manufactured to actual sizes required by DOC PS 20 for moisture content specified, to comply with requirements indicated below:

1. Provide dry lumber with 19 percent maximum moisture content at time of dressing.

E. Grade and Species: Provide dimension lumber of any species for truss chord and web members, graded as follows and of the following minimum design values for size of member required according to AFPA's "National Design Specification for Wood Construction" and its "Supplement":

2. Design Values: As indicated on structural drawings.

2.3 METAL CONNECTOR PLATES

A. General: Fabricate connector plates from metal complying with requirements indicated below.

B. Hot-Dip Galvanized Steel Sheet: Structural-quality steel sheet, zinc coated by hot-dip process complying with ASTM A 653, G60 (ASTM A 653M, Z180) coating designation; Grade 33 and not less than 0.0359 inch thick.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified below for material and manufacture.

1. Where truss members are exposed to weather or to high relative humidities, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of stainless steel, Type 304 or 316.


C. Power-Driven Fasteners: CABO NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts and Screws: ASME B18.2.1 (ASME B18.2.3.8M).
F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.5 METAL FRAMING ANCHORS

A. General: Provide metal framing anchors of structural capacity, type, size, metal, and finish indicated that comply with requirements specified, including the following:

1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for this Project.

2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 (ASTM A 653M, Z180) coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.

2.6 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

B. Protective Coatings: Provide one of the following coating systems:

1. SSPC-Paint 22, epoxy-polyamide primer.
2. SSPC-Paint 16, coal-tar epoxy-polyamide black or dark red paint.
3. SSPC-Paint 27 and SSPC-Paint 12, basic zinc chromate-vinyl butyral wash primer and cold-applied asphalt mastic.

2.7 FABRICATION

A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.

B. Fabricate metal connector plates to size, configuration, thickness, and anchorage details required to withstand design loadings for types of joint designs indicated.

C. Assemble truss members in design configuration indicated using jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances of ANSI/TPI 1. Position members to produce design camber indicated.

1. Fabricate wood trusses within manufacturing tolerances of ANSI/TPI 1.

D. Connect truss members by metal connector plates located and securely embedded simultaneously into both sides of wood members by air or hydraulic press.

3PART - EXECUTION
3.1 INSTALLATION

A. Do not install wood trusses until supporting construction is in place and is braced and secured.

B. Before installing, splice trusses delivered to Project site in more than one piece.

C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

D. Install and brace trusses according to recommendations of TPI and as indicated.

E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.

F. Space, adjust, and align trusses in location before permanently fastening and as follows:
   1. Truss Spacing: As indicated.

G. Anchor trusses securely at all bearing points using metal framing anchors. Install fasteners through each fastener hole in metal framing anchor according to manufacturer's fastening schedules and written instructions.

H. Securely connect each truss ply required for forming built-up girder trusses.
   1. Anchor trusses to girder trusses as indicated.

I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.

J. Do not cut or remove truss members.

K. Return wood trusses that are damaged or do not meet requirements to fabricator and replace with trusses that do meet requirements.
   1. Do not alter trusses in the field.

3.2 REPAIRS AND PROTECTION

A. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION 06192
SECTION 07311 - ASPHALT SHINGLES

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. Work under this section includes furnishing all labor, materials and equipment necessary to complete installation of asphalt roof shingles as shown on the Drawings and specified herein.

1.3 RELATED WORK

A. Related work specified in other sections:

1. Division 7: Sheet Metal Flashing and Trim.
2. Division 7: Roof Accessories.

1.4 GENERAL REQUIREMENTS:

A. Qualifications:

1. All roofing materials shall be installed by a subcontractor approved by the manufacturer and in accordance with manufacturer's applicable specifications for use over deck as indicated.

2. All roofing rolls, bundles and containers delivered to the job site shall be properly labeled as to their contents.

1.5 MATERIALS

A. Asphalt Shingles: Shall be Celotex Presidential Shake, Fiberglass Seal Down, U.L. Class A rated shingles. With a manufacturer's warranty of 40 years, Similar by Certain-Teed, GAF, or Johns-Manville are acceptable with Architect's approval, with a minimum weight of 360 lb. per square.

B. Underlayment: Existing 30# felt shall be repaired to allow for a smooth surface for application.

C. Fasteners: shall be 7/8" long x 7/16" head diameter galvanized roofing nails. Ridge cap fasteners shall be 1-1/4" long x 7/16 head diameter galvanized roofing nails. 11-12 gauge roofing nails.

1.6 GUARANTEE

A. "Provide a written guarantee that upon notice the Contractor will expedite replacing defective work at no cost to the Owner provided defects are brought to the attention of the Contractor in writing within two (2) years from date of acceptance of the roof in question."

1.7 INSTALLATION:
A. Install asphalt shingles roofing over one layer of felt underlayment. Shingles, 12" x 36" in size, require minimum 5 nails to each strip.

B. Install shingles to a straight horizontal line with a uniform exposure per manufacturer recommendations.

C. Install shingles with tight vertical joints so that the groove created between consecutive shingles is uniform with the grooves created within each individual shingle. Joints of shingles shall not align with the joints of shingles in courses directly below (stagger joints).

D. All nail heads shall be covered with successive rows of shingles or metal flashings. All nailing shall be in accordance with the manufacturer's recommendations.

E. Coordinate with installations of roof flashings, and roof vents.

F. Provide and install aluminum edge strips, with baked enamel finish, at all perimeter edges of roof.

G. Installation of roofing shall be in strict accord with the instructions and recommendations of the manufacturer.

END OF SECTION 07311